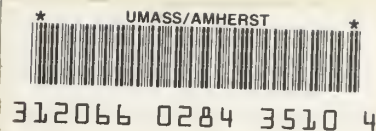


MASS. WRA1.2: R31/3



Residuals Management Facilities Plan



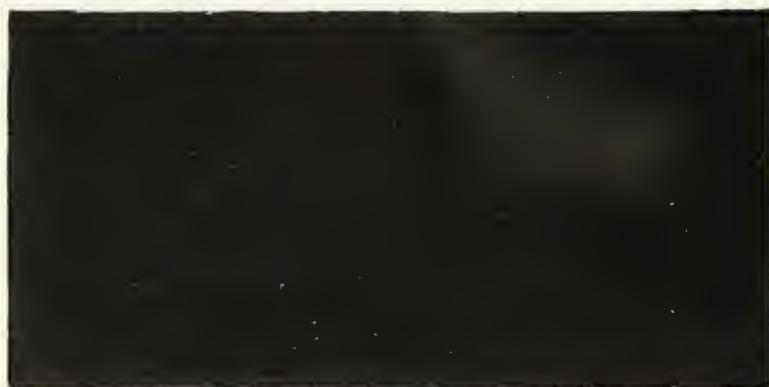
for a cleaner Boston Harbor



GOVERNMENT DOCUMENTS
COLLECTION

OCT 9 1987

University of Massachusetts
Depository Copy



Draft Report on
Candidate Options
Identification

August 1987

prepared for the
Massachusetts Water Resources Authority

TABLE OF CONTENTS
CANDIDATE OPTIONS IDENTIFICATION

	<u>PAGE</u>
EXECUTIVE SUMMARY	
INTRODUCTION	S-1
PROCESS FOR IDENTIFYING SYSTEM ALTERNATIVES	S-2
PROCESS FOR IDENTIFYING SITES TO BE MATCHED WITH SYSTEM ALTERNATIVES	S-8
DESCRIPTION OF CANDIDATE OPTIONS	S-9
SUMMARY	i
CHAPTER 1: PROCESS FOR IDENTIFYING SYSTEM ALTERNATIVES FOR LONG TERM RESIDUALS MANAGEMENT	
A. INTRODUCTION	1-1
B. METHODOLOGY	1-2
C. PERTINENT FINDINGS FROM ASSESSMENT STUDIES	1-3
1. Residuals Characterization	1-3
2. Assessment of Technologies	1-4
3. Transportation Assessment	1-7
D. PERTINENT INFORMATION FORM RELATED PLANNING ACTIVITIES	1-8
1. Deer Island Secondary Treatment Facilities Plan	1-8
2. Water Transport Facilities Plan	1-9
3. Interim Privatization Procurement	1-9
4. Compost Marketing Study	1-10

	<u>PAGE</u>
E. FIRST LEVEL DEVELOPMENT AND SCREENING OF ALTERNATIVES	1-11
1. Development of Generic Systems	1-11
2. Screening of Generic Systems	1-17
F. SECOND LEVEL DEVELOPMENT AND SCREENING OF ALTERNATIVES	1-19
1. Development of System Alternatives	1-19
2. Screening of System Alternatives	1-24
G. THIRD LEVEL SCREENING OF ALTERNATIVES	1-29
H. GENERAL SYSTEMS RECOMMENDED FOR CANDIDATE OPTIONS DEVELOPMENT	1-30
I. AREA REQUIREMENTS FOR SYSTEM ALTERNATIVE COMPONENTS	1-34
 CHAPTER 2: PROCESS FOR IDENTIFYING SITES TO BE MATCHED WITH SYSTEM ALTERNATIVES	
A. SITE IDENTIFICATION OVERVIEW	2-1
B. TECHNOLOGY SPECIFIC SITE LISTS	2-2
C. CRITERIA FOR SELECTING CANDIDATE SITES	2-5
1. Ranking	2-6
2. Site Use Flexibility	2-7
3. Development status	2-7
4. System Compatibility	2-8
5. Site Transportation Access	2-8
6. Permitting Feasibility	2-8
7. Variety of Site Types	2-9

	<u>PAGE</u>
D. APPLICATION OF SITE SELECTION CRITERIA	2-9
E. DESCRIPTION OF RECOMMENDED SITES	2-18

CHAPTER 3: DESCRIPTION OF CANDIDATE OPTIONS

A. INTRODUCTION	3-1
B. SUMMARY DESCRIPTION OF THE CANDIDATE OPTIONS	3-6

APPENDICES

A. TECHNOLOGY-SPECIFIC ORDERED SITE LISTS	
B. SITE SELECTION CRITERIA FACT SHEETS	
C. SITE ENVIRONMENTAL DATA SUMMARIES	
SP. MEPA SPECIAL PROCEDURE	

<u>LIST OF TABLES</u>	<u>PAGE</u>
S-U USERS GUIDE, SITE SCREENING ANALYSIS AND CANDIDATE OPTIONS IDENTIFICATION METHODOLOGIES	S-3
S-1 GENERAL SYSTEM ALTERNATIVES RECOMMENDED FOR CANDIDATE OPTIONS DEVELOPMENT	S-7
S-2 RECOMMENDED CANDIDATE SITES FOR RMFP	S-10
S-3 SUMMARY OF CANDIDATE OPTIONS	S-11
1-1 POSSIBLE MAJOR TECHNOLOGY GENERAL LOCATION COMBINATIONS	1-14
1-2 POSSIBLE MAJOR TECHNOLOGY WASTE TYPE COMBINATIONS	1-16
1-3 LAND AREA REQUIREMENTS FOR VARIOUS COMPONENTS SYSTEM ALTERNATIVES	1-30
2-1 TECHNOLOGY SPECIFIC SITE ACTIVITIES MINIMUM LAND AREA REQUIREMENT GUIDELINES	2-4
2-2 COASTAL PROCESSING SITE ORDERING	2-12
2-3 INLAND PROCESSING SITE ORDERING	2-15
2-4 INLAND LANDFILL SITE ORDERING	2-16
2-5 RECOMMENDED CANDIDATE SITES FOR THE MWRA RESIDUALS MANAGEMENT FACILITIES PLAN	2-19
3-1 SUMMARY OF CANDIDATE OPTIONS	3-2

<u>LIST OF FIGURES</u>	<u>AFTER PAGE</u>
S-1 LOCATION OF RECOMMENDED SITES FOR RMFP	S-9
1-1 COMPONENTS IN THE DEVELOPMENT OF CANDIDATE OPTIONS	1-1
1-2 SYSTEM DEVELOPMENT METHODOLOGY	1-2
1-3 ELEMENTS IN FORMULATING GENERIC SYSTEMS	1-11
1-4 MATRIX OF GENERIC SYSTEMS AFTER FIRST LEVEL SCREENING	1-18
1-5 COMPETITION FOR PRIMARY SLUDGE IN SYSTEM ALTERNATIVES	1-27
1-6 MATRIX OF SYSTEM ALTERNATIVES AFTER SECOND LEVEL SCREENING	1-29
1-7 MATRIX OF SYSTEM ALTERNATIVES AFTER THIRD LEVEL SCREENING	1-30
1-8 GENERAL SYSTEMS RECOMMENDED FOR CANDIDATE OPTIONS DEVELOPMENT	1-31
1-9 SYSTEM ALTERNATIVE H7	1-32
1-10 SYSTEM ALTERNATIVE I7	1-33
1-11 SYSTEM ALTERNATIVE J5	1-34
1-13 SYSTEM ALTERNATIVE L8	1-34
1-14 SYSTEM ALTERNATIVE N8	1-34
1-15 SYSTEM ALTERNATIVE P8	1-34

	AFTER <u>PAGE</u>
2-1 RMFP SITING PROCESS	2-2
2-2 CANDIDATE OPTION SITE SELECTION PROCESS	2-2
2-3 TECHNOLOGY SPECIFIC SITE ORDERING PROCESS	2-3
2-4 LOCATION OF RECOMMENDED SITES FOR RMFP	2-18
3-1 THE "P" FAMILY OF CANDIDATE OPTIONS	3-7
3-2 THE "N" FAMILY OF CANDIDATE OPTIONS	3-8
3-3 THE "L" FAMILY OF CANDIDATE OPTIONS	3-9
3-4 THE "K" FAMILY OF CANDIDATE OPTIONS	3-10
3-5 THE "J" FAMILY OF CANDIDATE OPTIONS	3-11
3-6 THE "I" FAMILY OF CANDIDATE OPTIONS	3-12
3-7 THE "H" FAMILY OF CANDIDATE OPTIONS	3-14
3-8 THE "G" FAMILY OF CANDIDATE OPTIONS (1 OF 3)	3-16
3-9 THE "G" FAMILY OF CANDIDATE OPTIONS (2 OF 3)	3-16
3-10 THE "G" FAMILY OF CANDIDATE OPTIONS (3 OF 3)	3-16

EXECUTIVE SUMMARY

INTRODUCTION

Since September 1986 the Massachusetts Water Resources Authority and its consultants have been engaged in the second phase of a planning effort, which is to lead to the siting, design, and construction of facilities for long-term management of residuals from the Authority's new primary and secondary wastewater treatment facilities on Deer Island. The study is called the Residuals Management Facilities Plan, or RMFP (see Table S-C, Chronology of RMFP Development). The current study is being conducted in accordance with a "Special Procedure" that was developed by the Executive Office of Environmental Affairs (EOEA) after the MWRA filed an Environmental Notification Form (ENF) and requested that this project be designated as Major and Complicated by EOEA. The Special Procedure (see Appendix SP) called for independent analyses of technologies, transportation, residuals characterization and sites to be completed before combining their results to form "candidate options" (alternatives including sites and technologies) for detailed engineering and environmental evaluation. These four assessments have recently been completed, and the Authority and its consultants are now preparing to thoroughly evaluate over thirty options for management of treatment residuals through the year 2020.

This is one of several documents that are being prepared as part of the RMFP that describe the candidate option and site selection process, and that will be formally submitted to The Massachusetts Environmental Policy Act (MEPA) Unit in August 1987:

- o **Candidate Options Identification**
 - Chapter 1: Process for Identifying System Alternatives
 - Chapter 2: Process for Identifying Sites to be Matched with System Alternatives
 - Chapter 3: Description of Candidate Options

TABLE S-C

CHRONOLOGY OF RESIDUALS MANAGEMENT FACILITIES PLAN DEVELOPMENT

DESCRIPTION OF ACTIVITY	REPORT PREPARED/PLANNED	SCHEDULE
Phase I		
Assessed existing condition in the MWRA sewer service area and projected future residuals management needs.	RMFP Interim Report No. 1	December 1985
Initial screening of technology and siting options for satisfying future needs.	RMFP Interim Report No. 2	March 1986

MWRA files Environmental Notification form and requests project be designated "Major and Complicated".	MEPA Special Procedure	February 1986

Phase II		
Reassessment of anticipated quality and quantity of future residuals.	Characterization of Residuals	February 1987
Review of 12 major technologies and determination of those most viable.	Technology Assessment	February 1987
Analysis of transportation requirements and options available.	Assessment of Transportation Alternatives	February 1987
Develop site identification, evaluation, and screening methodology. Identification of additional sites. Coastal, inland, and island sites treated and screened equally for all potential technologies.	Site Screening Analysis, Volume I: Methodology	August 1987
	Site Screening Analysis, Volume II: Results	August 1987
Combine the results of the Residuals Characterization, Technology and Transportation Assessments, and Site Screening Analysis to form candidate options, or complete residuals management alternative (including specific sites), for more detailed engineering and environmental analysis.	Candidate Option Identification	August 1987
Development of evaluation criteria. In-depth engineering and environmental analysis of approximately 30 candidate options for future residuals management. Selection by MWRA Board of Directors of "preferred" option and possibly one or two alternates.	Draft RMFP and EID/EIR (Candidate Options Evaluation)	Mid 1988
Review of public and agency comments on Draft RMFP and EID/EIR. Confirmation of preferred option or selection of another.	Final RMFP and EID/EIR (Options Analysis)	Fall 1988

- o Site Screening Analysis, Volume I: Methodology
- o Site Screening Analysis, Volume II: Results

Table S-U describes the principal steps in the Site Screening Analysis and Candidate Options Identification processes and where in the respective separate reports the detailed information about each step can be found.

The second phase of the Residuals Management Facilities Plan (RMFP) is to bring together the results of the Residuals Characterization, Technology Assessment, Transportation Assessment and Site Screening Analysis to develop a reasonable number of candidate options or complete residual management alternatives. Complete residuals management alternatives define the waste streams treated, by what technologies, where they are treated, and how they are transported to and from processing and disposal sites.

The identification of candidate options involved the development and screening of residuals system alternatives, and the identification and ranking of sites to accommodate residuals treatment and disposal processes. These elements were conducted independent of one another, then the results were matched to form candidate options. Rather than identifying several "good" sites and allowing the site characteristics to drive the development of candidate options, the intent was to first define the best possible systems for residuals handling and processing and then match these systems with the sites that best suit the technical needs.

PROCESS FOR IDENTIFYING SYSTEM ALTERNATIVES

The system alternatives combine the most feasible technologies and transportation methods with the following general siting considerations:

- o the residuals will be generated principally at the location of the treatment plant, Deer Island, and must be processed on island or transferred off island for processing at another Harbor Island or mainland location;

USERS GUIDE
SITE SCREENING ANALYSIS AND
CANDIDATE OPTIONS IDENTIFICATION METHODOLOGIES

The following describes the principal steps in the Site Screening Analysis and Candidate Options Identification Processes and where in the respective separate reports the detailed information about each step can be found.

STEP	SITE SCREENING REPORTS	CANDIDATE OPTIONS IDENTIFICATION REPORT
Develop site identification criteria	Chapter 1	
Develop initial site screening criteria	Pages 2-2 - 2-12 Table 2-1 Appendix A	
Establish suitability scale for site evaluation features (sub-criteria of initial site screening criteria)	Pages 2-12 - 2-13 Table 2-2	
Develop attitudinal survey weighting factors; (opinions from public regarding relative importance of each screening criterion)	Page 2-13 Figures 2-1, 2-2 Tables 2-3, 2-4	
Collect and field verify existing data on all 299 sites	Chapter 3	
Score 299 sites (results in raw scores for each of 10 criteria, raw total scores, and total score weighted by results of attitudinal survey; weighted scores determined ordering of sites 1-299).	Chapter 4; Volume II, Results	
Sites re-ordered based on current development status.	Chapter 4	
Develop technology specific weighting factors (coastal transfer/dewatering, combustion, composting, landfill).	Chapter 5 Table 5-1	

TABLE S-U (continued)
USERS GUIDE

STEP	SITE SCREENING REPORTS	CANDIDATE OPTIONS IDENTIFICATION REPORT
Sort all sites by acreages for four residuals functions: coastal transfer and dewatering (5); combustion only (8); composting only (25); composting and combustion (30); landfill (100).	Chapter 5 Figure 5-1	Chapter 2
Apply technology specific weighting factors to appropriate lists.	Table 5-1 Page 5-14	
Produce 8 technology-specific ordered lists from which sites were selected using site selection factors.	Volume II, Results	Chapter 2
Summarize results of initial three reports (Residuals Characterization, Technology Assessment, Transportation Assessment) to develop technical conclusions and develop system alternatives for residuals management.		Chapter 1
Develop 7 factors for selection of sites to form candidate options (ranking, flexibility, compatibility, transportation access, permitting feasibility, development status, variety of sites.		Chapter 2
Using selection factors, select small number of sites from 8 Chapter 2 ordered technology-specific lists to be matched with 7 system alternatives.		Chapter 2
Describe 31 candidate options (full technology/transportation alternatives) for further detailed evaluation in next phase, Candidate Options Evaluation.		Chapter 3

- o the residuals must be brought onto the mainland at some coastal location for processing and/or transfer inland;
- o the residuals must be transported inland to some location(s) for ultimate disposal and/or further processing or utilization.

Each system alternative includes certain residuals processing and/or handling activities at each of these site types - island, coastal, and inland.

Among the principal conclusions drawn by the MWRA's residuals consultant from the preceeding technical evaluations are:

- o Two major technologies should be employed in the future to ensure reliability of the MWRA's residuals management program.
- o Composting of primary sludge, beginning in 1995 with the startup of consolidated primary treatment facilities on Deer Island, and combustion of secondary sludge, beginning in 1999 when secondary treatment facilities come on line, are the two recommended technologies. (Further documentation of these recommendations will be developed in the Candidate Options Evaluation, with emphasis on two issues. First, that MWRA compost will be of high enough quality so as to not unduly restrict the magnitude of a future compost distribution program. And second, that the proposed timing of facilities construction will provide sufficient reliability in the residuals management program, particularly during the period 1995-1999 when only composting facilities would on-line and a landfill would be relied on for emergency backup.)
- o A landfill is needed for the disposal of grit, screenings, and ash from the combustion process. The landfill should also serve in emergencies as the backup technology to composting during the period 1995-1999.
- o Sludge dewatering should not be located on Deer Island unless processing is to be located there. Residuals should be transported from Deer Island by pipeline and/or barge.

Therefore, the MWRA's long-term residuals management program has the following siting needs:

- o Landfill site for "minor" residuals and for dewatered sludge during emergencies. Minimum net area requirement: 100 acres. This requirement could be fulfilled through the use of one or more sites for this purpose. Actual area requirement will vary considerably from site to site based on specific site characteristics.
- o Coastal transfer site for receiving residuals from pipeline or barge and transferring onto truck or rail. Minimum net area requirement: 5 acres.
- o Processing site or sites for sludge combustion and for producing sludge compost. The two technologies could be sited together or at two or more locations. Potential sites for processing are: (1) adjacent to the treatment plant on Deer Island; (2) on another Harbor Island; (3) at the coastal transfer site; or (4) at an inland processing site within the MWRA sewer service area. Minimum net area requirements: 8 acres for combustion only, 25 acres for composting only, 30 acres for both composting and combustion.

In order to identify the most reasonable system alternatives, a systematic approach was used to first develop, then screen all possible combinations of systems. The key findings from the assessment reports recently completed, along with pertinent information from previous or on-going studies, formed the basis for systems development and screening. Beginning with three general site types (island, coastal, and inland), three technologies (composting, combustion, and landfilling), and two waste types (raw and digested sludges), a total of 342 possible technology/transport/site type combinations were initially developed. A series of screening steps were then undertaken based on conclusions from the four assessments to identify seven "most promising" system alternatives for matching with specific sites to form candidate options. These are listed in Table S-1. By considering alternate coastal transfer and processing site locations, these seven system alternatives will be transformed into several times this number of candidate options (alternatives) for more detailed evaluation in upcoming months. The results of the Candidate Options Evaluation phase will be the selection of one or more preferred alternatives by the MWRA Board of Directors, and preparation of draft Environmental Information Document (EID), facility plan, and Environmental Impact Report (EIR).

TABLE S-1

GENERAL SYSTEM ALTERNATIVES RECOMMENDED
FOR CANDIDATE OPTIONS DEVELOPMENT

<u>General System</u>	← <u>General Locations</u> →		
	<u>Deer or Harbor Island</u>	<u>Coastal Site</u>	<u>Inland Site</u>
H	Combustion	Composting	-
I	Combustion	-	Composting
J	Composting	Combustion	-
K	-	Combustion/Composting	-
L	-	Combustion	Composting
N	-	Composting	Combustion
P	-	-	Combustion/Composting

PROCESS FOR IDENTIFYING SITES TO BE MATCHED WITH SYSTEM ALTERNATIVES.

The Site Screening Analysis drew upon the most current published information that was consistently available for the study area, such as surrounding land use, delineation of wetlands, and historical and archeological resources. This information was verified to the extent possible by a brief visit to each of the 299 sites, at which time information on surrounding sensitive receptors and development status was updated. Point scores were derived for the sites individually to determine the relative environmental and technical suitability of the sites to accommodate some component of the residuals management program. The 299 sites comprising the universe of potential locations were scored and given a preliminary ordering from most potentially suitable to least potentially suitable. The initial site ordering was refined in a subsequent technology-specific screening. The technology-specific ordering incorporated consideration of technology-specific factors to produce separate ordered lists for each of the residuals program siting needs of the recommended systems alternatives.

Since multiple sites will be needed for future residuals management (coastal transfer, processing, and landfiling), the sites within a candidate option should have some reasonable compatibility with one another and have characteristics that enhance the functioning of a system alternative. Therefore, an additional set of criteria or factors was developed for selecting specific sites from the technology-specific ordered lists for detailed analyses in the Candidate Options Evaluation. Following are the factors used in the candidate option site selection.

- o **Ranking**, or the applicable technology-specific numerical ranking from the Site Screening Analysis.
- o **Site Use Flexibility**, including site size and the adaptability that the site provides for current program uses and potential changes in future program needs.

- o **Development Status;** the current and near future availability of the site in light of know competing plans for site use.
- o **System Compatibility** with respect to geographic locations of other sites within each system alternative.
- o **Site Transportation Access;** the ease or difficulty with which the transportation needs of the system alternatives could be accommodated.
- o **Permitting Feasibility;** the presence of any major or insurmountable permitting obstacle that would cause and site to be dropped from further consideration based on the proposed use of the site.
- o **Variety of Site Types,** to provide decision-makers with a range of geographic options for future residuals management.

The 12 sites recommended for further evaluation as a location for one or more components of the residuals management program as a result of applying these criteria to the technology-specific site listings are displayed in Table S-2 and their locations are shown on Figure S-1. The recommended sites fell into the following categories:

- o Island Processing Sites (2)
- o Coastal Processisng and/or Transfer (2)
- o Inland Processing Sites (3)
- o Inland Lanfill Sites (5)

DESCRIPTION OF CANDIDATE OPTIONS

By matching the seven system alternatives with the two island, two coastal, and three inland processing sites that have been recommended for further evaluation, 25 candidate options (site/technology combinations) are formed. These candidate options are summarized in Table S-3. Also listed are an additional six candidate options that are potentially viable as a result of Spectacle Island being selected for further evaluation. Therefore, a total of 31 candidate options have been identified that will be the subject of detailed engineering and environmental analyses in the upcoming

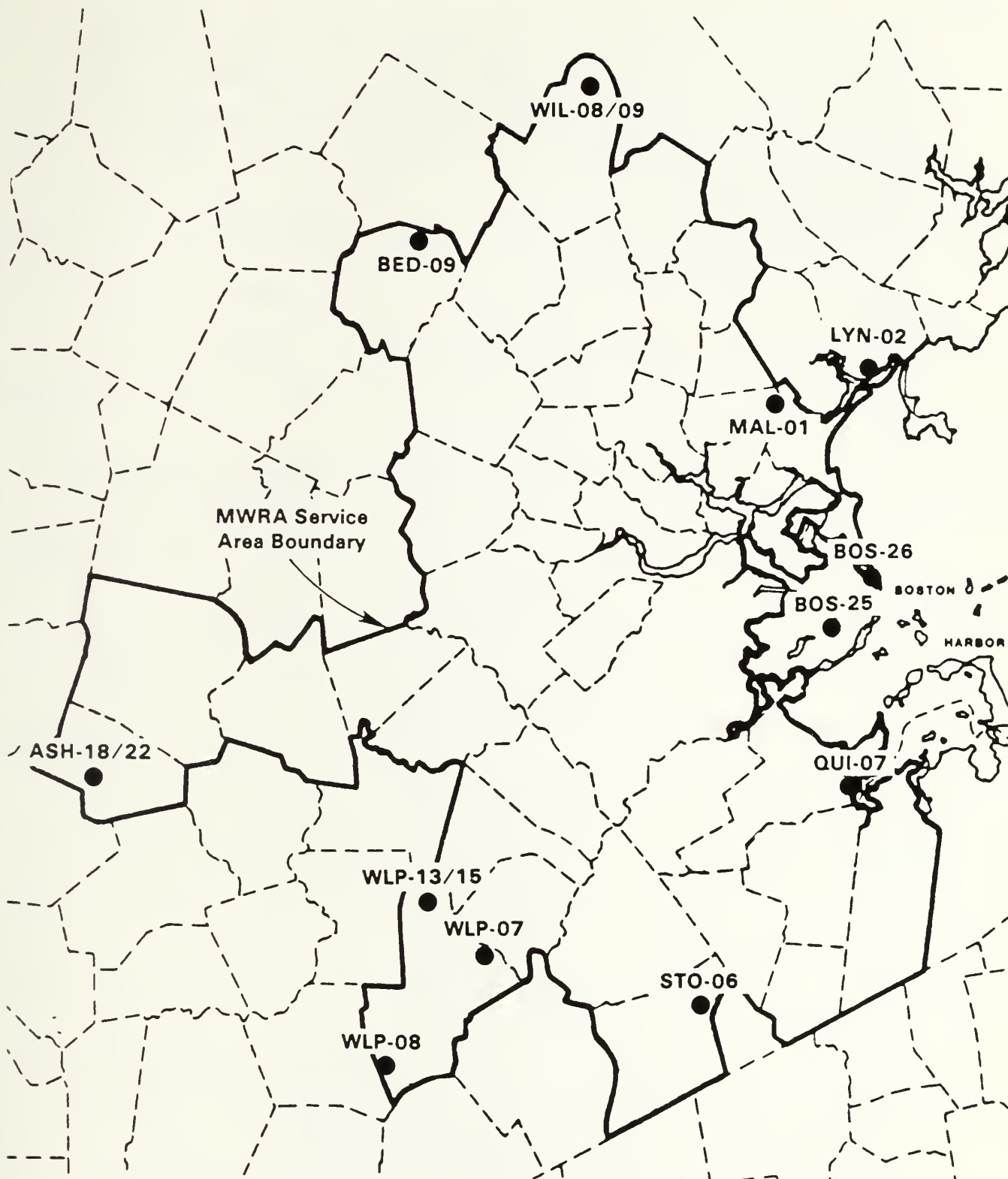
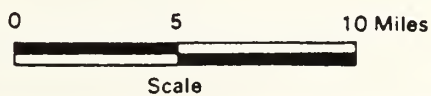


Figure S-1 Location of Recommended Sites for RMFP



Candidate Options Evaluation. The process for identifying system alternatives was conducted concurrently with and independently from the Site Screening Analysis. The system alternative that called for accommodating both composting and combustion on Deer Island was initially screened out due to land area limitations on Deer Island. Spectacle Island ranked very highly in the site screening process and was selected along with Deer Island to be evaluated in more detail as a possible site for some component of the residuals management program. With the larger land area available on Spectacle Island, this island either alone or in combination with Deer Island could potentially accommodate both technologies; thus, creating an additional six candidate options.

The 31 candidate options include various combinations of locating the two major technologies either together at the same site or separately at two locations. It would also be possible to utilize multiple composting and multiple combustion facilities at various locations to satisfy future residuals management needs. Full consideration of this possibility at this early stage of the planning process is not practical because of the hundreds of possible technologies/sites combinations that would result. However, later in the planning process when the impacts of concentrating the facilities at single sites have been determined, it will be possible to evaluate whether facilities at multiple sites from among the 12 identified would be desirable. However, evaluation of multiple site options must also account for the resulting multiple transportation routes and associated impacts.

Five of the 12 sites recommended for further evaluation were identified as potential sites for ash, grit, and screenings landfilling. During the upcoming Candidate Options Evaluation these sites will not initially be matched with specific candidate processing and coastal transfer sites, but instead will be carried as a "pool" of sites. The best, or most acceptable site will be selected for fulfilling the minor residuals landfilling need, irrespective of which site/technology combination is selected for sludge management. This is possible because a significant portion of the residuals to be

TABLE S-2

RECOMMENDED CANDIDATE SITES FOR THE MWRA RESIDUALS MANAGEMENT FACILITIES PLAN

SITE ID	COMMUNITY	LOCATION	AVAILABLE ACREAGE*	POTENTIAL USE**
<u>ISLAND SITES</u>				
	BOSTON	DEER ISLAND	20-30	COMPOSTING OR COMBUSTION
	BOSTON	SPECTACLE ISLAND	75	COMPOSTING AND/OR COMBUSTION
<u>COASTAL SITES</u>				
	LYNN	LYNN HARBOR NEAR SEWAGE TREATMENT PLANT	50	TRANSFER, COMPOSTING AND/OR COMBUSTION
	QUINCY/BRAINTREE	QUINCY SHIPYARD	150	TRANSFER, COMPOSTING AND/OR COMBUSTION
<u>INLAND SITES</u>				
	STOUGHTON	OFF RT. 139, 1 MILE SOUTH OF CANTON LINE	90	COMPOSTING AND/OR COMBUSTION
	WALPOLE	OFF WASHINGTON STREET NEAR NORWOOD LINE	75	COMPOSTING AND/OR COMBUSTION
	WILLMINGTON	NEAR WILMINGTON/ANDOVER LINE OFF RT. 125	50	COMPOSTING AND/OR COMBUSTION
<u>LANDFILL SITES</u>				
	ASHLAND	NORTHWEST OF RT. 135 NEAR HOPKINTON BORDER	290	ASH, GRIT AND SCREENINGS LANDFILL
	BEDFORD	SOUTHWEST OF RT. 3 EAST OF SPRINGS ROAD	90	ASH, GRIT AND SCREENINGS LANDFILL
	MALDEN/REVERE	QUARRY EAST OF RT. 1 NORTH OF SALEM STREET	45	ASH, GRIT AND SCREENINGS LANDFILL
	WALPOLE	ADJACENT TO MCI CEDAR JUNCTION	100	ASH, GRIT AND SCREENINGS LANDFILL
	WALPOLE	SOUTH OF RT. 109 AT MEDFIELD LINE	675	ASH, GRIT AND SCREENINGS LANDFILL

* Minimum area requirements:

Transfer	5 acres
Combustion only	8 acres
Composting only	25 acres
Composting and Combustion	30 acres
landfilling (one or more sites)	100 acres

** Sites to be evaluated for any one or all of the potential used noted.

TABLE S-3

SUMMARY OF CANDIDATE OPTIONS

<u>System Alternative Reference**</u>	<u>Island Location</u>	<u>Coastal Location</u>	<u>Inland Processing Location</u>	<u>Inland Land Disposal Location</u>
P8-01	NA	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting/combustion	*
P8-02	NA	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting/combustion	*
P8-03	NA	LYNN SITE o transfer	WILMINGTON SITE o composting/combustion	*
N8-01	NA	QUINCY SHIPYARD o transfer/composting	WALPOLE SITE o combustion	*
N8-02	NA	QUINCY SHIPYARD o transfer/composting	STOUGHTON SITE o combustion	*
N8-03	NA	LYNN SITE o transfer/composting	WILMINGTON SITE o combustion	*
L8-01	NA	QUINCY SHIPYARD o transfer/combustion	WALPOLE SITE o composting	*
L8-02	NA	QUINCY SHIPYARD o transfer/combustiong	STOUGHTON SITE o composting	*
L8-03	NA	LYNN SITE o transfer/combustiong	WILMINGTON STIE o composting	*
K8-01	NA	QUINCY SHIPYARD o transfer, composting, combustion	NA	*
K8-02	NA	LYNN SITE o transfer, composting, combustion	NA	*
J5-01	DEER ISLAND o composting	QUINCY SHIPYARD o transfer/combustion	NA	*
J5-02	DEER ISLAND o composting	LYNN SITE o transfer/combustion	NA	*
J5-03	SPECTACLE ISLAND o composting	QUINCY SHIPYARD o transfer/combustion	NA	*
J5-04	SPECTACLE ISLAND o composting	LYNN SITE o transfer/combustion	NA	*
I7-01	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting	*

TABLE S-3 (CONT)
SUMMARY OF CANDIDATE OPTIONS

<u>System Alternative Reference**</u>	<u>Island Location</u>	<u>Coastal Location</u>	<u>Inland Processing Location</u>	<u>Inland Land Disposal Location</u>
I7-02	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting	*
I7-03	DEER ISLAND o combustion	LYNN SITE o transfer	WILMINGTON SITE o composting	*
I7-04	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting	*
I7-05	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting	*
I7-06	SPECTACLE ISLAND o combustion	LYNN SITE o transfer	WILMINGTON SITE o composting	*
H7-01	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer/composting	NA	*
H7-02	DEER ISLAND o combustion	LYNN SITE o transfer/composting	NA	*
H7-03	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer/composting	NA	*
H7-04	SPECTACLE ISLAND o combustion	LYNN SITE o transfer/composting	NA	*
G5-01	SPECTACLE ISLAND o combustion/ composting	QUINCY SHIPYARD o transfer	NA	*
G5-02	SPECTACLE ISLAND o combustion/ composting	LYNN SITE o transfer	NA	*
G5-03	DEER ISLAND o combustion SPECTACLE ISLAND o composting	QUINCY SHIPYARD o transfer	NA	*
G5-04	DEER ISLAND o combustion SPECTACLE ISLAND o composting	LYNN SITE o transfer	NA	*
G5-05	DEER ISLAND o composting SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	NA	*
G5-06	DEER ISLAND o composting SPECTACLE ISLAND o combustion	LYNN SITE o transfer	NA	*

NA - Not Applicable

* - Landfill sites proposed for further evaluation include the Malden quarry, Ashland site, two sites in Walpole, and the Bedford site.

** System alternatives P, N, L, K, J, I, and H are the "general" system alternatives that were recommended for further evaluation in Chapter 1.

landfilled originate at a number of headworks facilities at dispersed locations in the MWRA service area, and only 3 to 5 truck trips per day will be required to transport ash from the combustion processing site to the landfill on a 7 days/week basis. Therefore, the proximity of the landfill site to the other sites selected for residuals processing and coastal transfer is not a critical concern. The "pool" of sites to be evaluated for fulfilling the need for a minor residuals landfill consists of:

- o Magunco Hill and area north, Town of Ashland (ASH-18/22)
- o Commonwealth of Massachusetts near Middlesex Community College, Town of Bedford (BED-09)
- o the Rowe Quarry, straddling the Malden/Revere line (MAL-01)
- o Commonwealth of Massachusetts near MCI Cedar Junction, Town of Walpole (WLP-08)
- o site in North Walpole (WLP-13/15)

Evaluation criteria to facilitate the selection of a preferred landfill site as well as a preferred candidate option are currently under development, and will be submitted to the MWRA Board of Directors for approval following a period of public and agency review. Included will be such factors as cost, technical feasibility, environmental and community impacts and equitable distribution of regional responsibilities.

Since the candidate options are formed by matching specific processing and coastal transfer sites with the system alternatives, the following presentation of the candidate options has been arranged into "families" of candidate options according to the system alternatives from which they were derived. The reader is referred to Chapter 1 for a description of the system alternative development process and nomenclature.

The "P" Family of Candidate Options call for both composting and combustion of sludge at a common inland processing site. Three

site/technology combinations are possible under this residuals management scenario.

- o P8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer onto truck or rail for transport to the **Walpole** processing site. A portion of the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Walpole site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o P8-02 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer onto truck for transport to the **Stoughton** processing site. A portion of the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Stoughton site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o P8-03 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site either by barge or pipeline, for dewatering and transfer onto truck for transport to the **Wilmington** processing site. A portion of the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Wilmington site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "N" Family of Candidate Options call for **composting** of a portion of the sludge at a coastal site, with **combustion** of the balance at an inland processing site. Three site/technology combinations are possible under this management scenario.

- o N8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the shipyard for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck or rail to the **Walpole** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill.

- o N8-02 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the shipyard for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck to the **Stoughton** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill for ultimate disposal.
- o N8-03 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the Lynn site for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck to the **Wilmington** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill.

The "L" Family of Candidate Options interchange the locations for the two technologies, calling for **combustion at a coastal location and composting inland**. Again, three site/technology combinations are possible.

- o L8-01 - Digested sludge would be transported from Deer Island to the Quincy Shipyard, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Quincy Shipyard** site. The balance of the dewatered sludge would be transported by truck or rail to the Walpole site for composting. Composted sludge would be distributed from the **Walpole** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o L8-02 - Digested sludge would be transported from Deer Island to the Quincy Shipyard, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Quincy Shipyard**. The balance of the dewatered sludge would be transported by truck to the Stoughton site for composting. Composted sludge would be distributed from the **Stoughton** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o L8-03 - Digested sludge would be transported from Deer Island to the Lynn South Harbor site, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Lynn** site. The balance of the dewatered

sludge would be transported by truck to the Wilmington site for composting. Composted sludge would be distributed from the **Wilmington** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "K" Family of Candidate Options call for both **composting and combustion of sludge at a common coastal processing site**. Two site/technology combinations are possible under this residuals management scenario.

- o K8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the dewatered sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Quincy Shipyard site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o K8-02 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, from dewatering. A portion of the dewatered sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Lynn site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "J" Family of Candidate Options call for the **composting of a portion of the sludge at an island site, with combustion of the balance at a coastal processing site**. In both cases, sludge would be processed as a raw material without prior digestion on Deer Island. Because the sludge would not be digested, transport of the sludge to the processing location would be restricted to pipeline. Four site/technology combinations are possible.

- o J5-01 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported as a liquid from Deer Island to the **Quincy Shipyard** by pipeline for dewatering and combustion. The composted sludge would be transported by truck on ferry to the shipyard for distribution to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

- o J5-02 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported as a liquid from Deer Island to the **Lynn South Harbor** site by pipeline for dewatering and combustion. the composted sludge would be transported by truck on ferry to the Lynn site for distribution to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o J5-03 - Raw primary sludge would be transported as a liquid by pipeline from Deer Island to **Spectacle Island** for dewatering and composting. Raw secondary sludge would be transported as a liquid by pipeline from Deer Island to the **Quincy Shipyard** for dewatering and combustion. Compost would be brought to the shipyard by truck on ferry for distribution to various inland sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o J5-04 - Raw primary sludge would be transported as a liquid by pipeline from Deer Island to **Spectacle Island** for dewatering and composting. Raw secondary sludge would be transported as a liquid by pipeline from Deer Island to the **Lynn South Harbor** site for dewatering and combustion. Compost would be brought to the Lynn site by truck on ferry for distribution to various inland sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "I" Family of Candidate Options call for the combustion of a portion of the sludge at an island site, with composting of the balance of sludge at an inland processing site. A coastal site would be used only for dewatering and transfer. Six site/technology combinations are possible.

- o I7-01 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer inland to the **Walpole** processing site for composting. Composted sludge would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported from Deer Island to the Quincy Shipyard, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.
- o I7-02 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested

and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer inland to the **Stoughton** processing site for composting. Composted sludge would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported from Deer Island to the Quincy Shipyard, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.

- o I7-03 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and transfer inland to the **Wilmington** processing site for composting. Composted sludge would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported from Deer Island to the Lynn site, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.
- o I7-04 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. Dewatered sludge would be transferred onto truck or rail for transport to the **Walpole** site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Quincy shipyard for transport to the minor residuals landfill for ultimate disposal.
- o I7-05 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. Dewatered sludge would be transferred onto truck for transport to the **Stoughton** site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.
- o I7-06 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering. Dewatered sludge would be transferred onto truck for transport to the

Wilmington site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Lynn site for transport to the minor residuals landfill for ultimate disposal.

The "H" Family of Candidate Options call for the combustion of a portion of the sludge (raw) at an island site, with the balance of the sludge (either raw or digested) to be composted at a coastal processing site. Four site/technology combinations are possible under this scenario.

- o H7-01 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and composting. Composted sludge would be distributed from the shipyard to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Deer Island to the shipyard for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-01, primary sludge would be pipelined to the shipyard as a raw material and composted.
- o H7-02 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and composting. Composted sludge would be distributed from the Lynn site to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Deer Island to the Lynn site for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-02, primary sludge would be pipelined to the Lynn site as a raw material and composted.
- o H7-03 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and composting. Compost would be distributed from the shipyard to various sites for beneficial uses. Ash from sludge combustion would be transported by truck on ferry from Spectacle Island to the shipyard for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-03, primary sludge would be pipelined as a raw material to the shipyard and composted.

- o H7-04 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and composting. Compost would be distributed from the Lynn site to various sites for beneficial uses. Ash from sludge combustion would be transported by truck on ferry from Spectacle Island to the Lynn site for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-04, primary sludge would be pipelined to the Lynn site as a raw material and composted.

The "G" Family of Candidate Options call for both **combustion and composting of sludge at island sites**, with the technologies located either at a single island site or divided between the two. Six site/technology combinations are possible under this management scenario.

- o G5-01 - Raw sludge would be transported by pipeline to **Spectacle Island** for dewatering and processing. Raw primary sludge would be composted, raw secondary sludge would be combusted. Compost would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for distribution to various sites for beneficial uses. Ash from the combustion process would be transported from Spectacle Island to the shipyard for transport to the minor residuals landfill for ultimate disposal.
- o G5-02 - Raw sludge would be transported by pipeline to **Spectacle Island** for dewatering and processing. Raw primary sludge would be composted, raw secondary sludge would be combusted. Compost would be transported by truck on ferry from Spectacle Island to the **Lynn South Harbor** site for distribution to various sites for beneficial uses. Ash from the combustion process would be transported from Spectacle Island to the Lynn site for transport to the minor residuals landfill for ultimate disposal.
- o G5-03 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Raw primary sludge would be transported by pipeline from Deer Island to **Spectacle Island**, for dewatering and composting. Compost would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for distribution to various sites for beneficial uses. Combustion ash would be transported from Deer Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.

- o G5-04 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Raw primary sludge would be transported by pipeline from Deer Island to **Spectacle Island**, for dewatering and composting. Compost would be transported by truck on ferry from Spectacle Island to the **Lynn South Harbor** site for distribution to various sites for beneficial uses. Combustion ash would be transported from Deer Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.
- o G5-05 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. The combustion ash would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for transport to the minor residuals landfill for ultimate disposal. Compost would be transported from Deer Island to the shipyard for distribution to various sites for beneficial uses.
- o G5-06 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. The combustion ash would be transported by truck on ferry from Spectacle Island to the **Lynn South Harbor** site for transport to the minor residuals landfill for ultimate disposal. Compost would be transported from Deer Island to the Lynn site for distribution to various sites for beneficial uses.

CHAPTER 1
PROCESS FOR IDENTIFYING SYSTEM ALTERNATIVES
FOR LONG TERM RESIDUALS MANAGEMENT

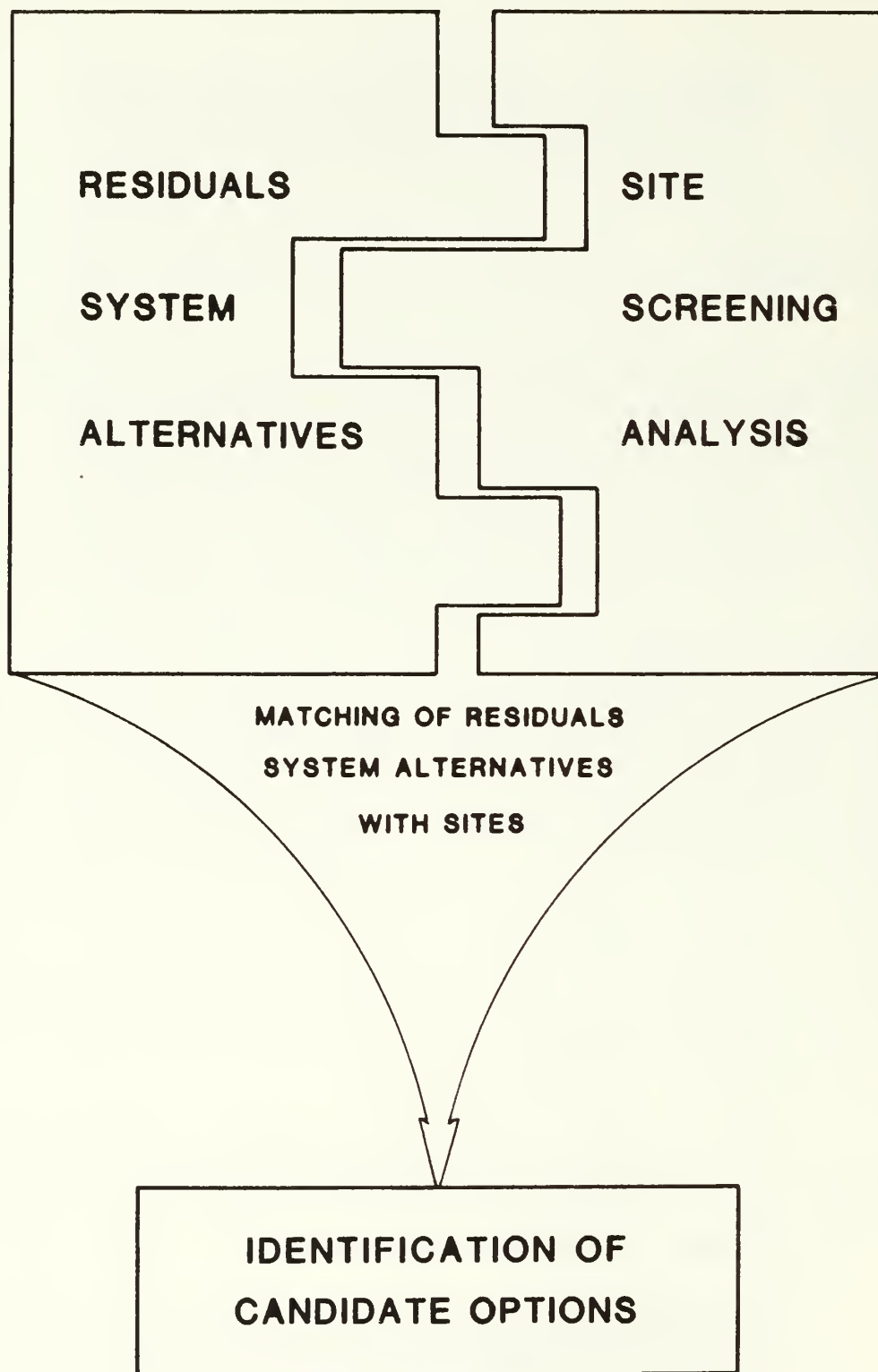
A. INTRODUCTION

The second phase of the Residuals Management Facilities Plan (RMFP) is to bring together the results of the Residuals Characterization, Technology Assessment, Transportation Assessment and Site Screening Analysis to develop a reasonable number of candidate options or complete residual management alternatives. Complete residuals management alternatives define the waste streams treated, by what technologies, where they are treated, and how they are transported to and from processing and disposal sites.

As shown in Figure 1-1, the identification of candidate options involved the development and screening of residuals system alternatives, and the identification and ranking of sites to accommodate residuals treatment and disposal processes. These elements were conducted independent of one another, then the results were matched to form candidate options. Rather than identifying several "good" sites and allowing the site characteristics to drive the development of candidate options, the intent was to first define the best possible systems for residuals handling and processing and then match these systems with the sites that best suit the technical needs.

A residuals system alternative involves considerations of technology, transportation, and residuals characteristics, together with the recognition that Deer Island has already been selected as the site for the consolidated primary and secondary treatment facilities; and

- o the residuals will be generated principally at the location of the treatment plant on Deer Island, and they must be processed on island or transferred off island for processing elsewhere;
- o they must be brought onto the mainland at some coastal location for processing and/or transfer or pipeline transport inland;



- o they must be transported inland to some location(s) for ultimate disposal and/or further processing or utilization.

Other than these general locational factors, system alternatives do not, at this point in the process, require the identification of specific coastal or inland sites.

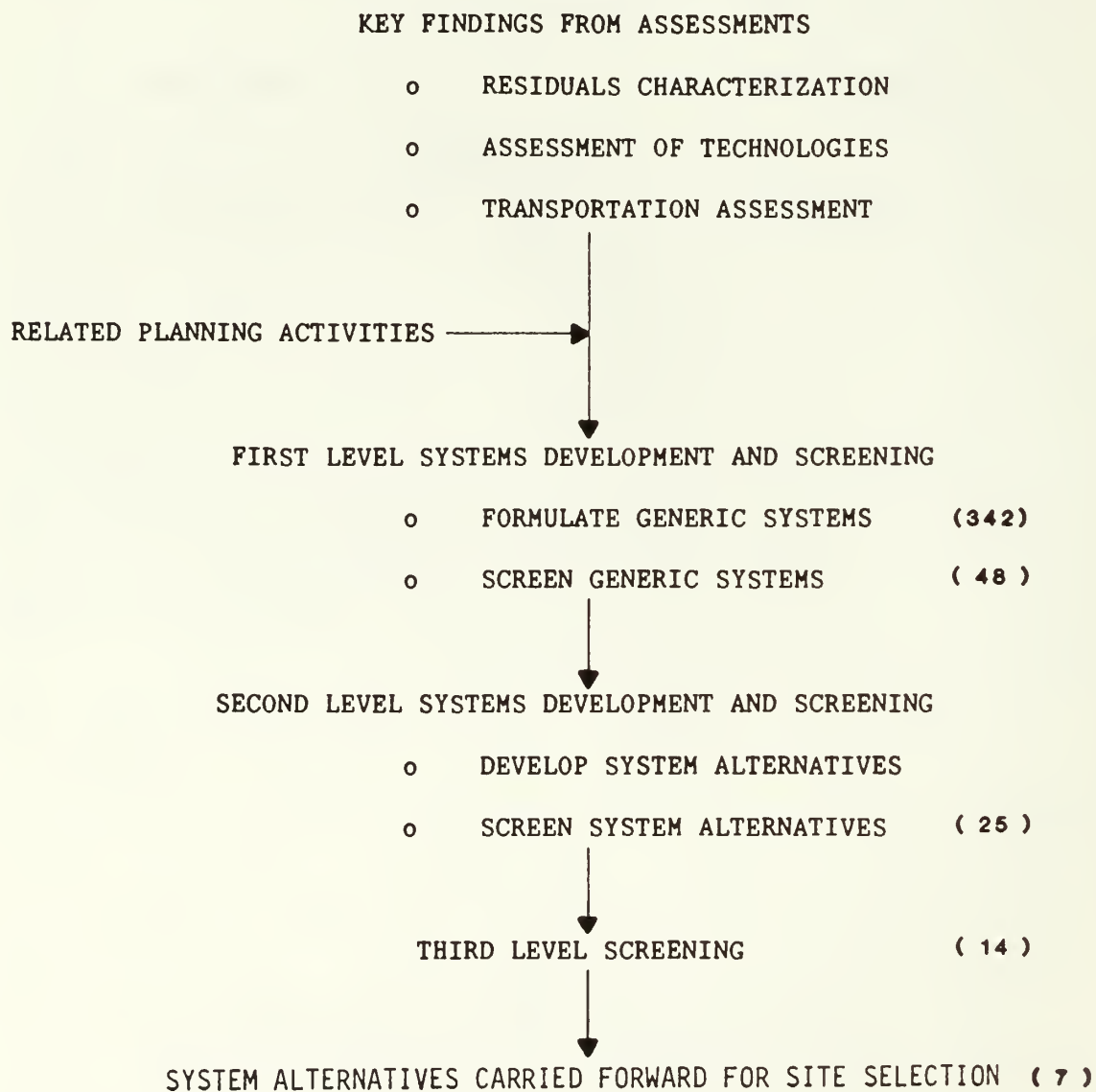
B. METHODOLOGY

In order to identify the most reasonable system alternatives, a systematic approach was used to first develop, then screen all possible combinations of systems. This approach is outlined on Figure 1-2. The key findings from the assessment reports recently completed, along with pertinent information from previous or on-going studies, formed the basis for all systems development and screening. The Assessment of Technologies, Transportation Assessment, and Residuals Characterization were conducted on coordinated but independent tracks. Therefore, the initial step in drawing these study elements together was to summarize and collectively analyze their principal findings as they relate to the definition of residuals system alternatives. This became an iterative process as more and more detailed information was required to further develop and screen the system alternatives.

Two levels of development and three levels of screening were conducted. In the first level, generic systems were developed. A generic system is defined by major technologies, general site types, and residuals to be processed. These systems are considered "generic" because they lack detailed information on the support technologies and transport modes necessary to implement the system. All possible systems were formed from the major conclusions of the assessments and other pertinent information from related planning activities. Once defined, screening criteria were applied to all systems. Those generic systems which failed to satisfy the criteria were eliminated from further consideration.

The next step involved a second level of systems definition and screening. The generic systems surviving the first level screening process were given further definition and transformed into system

SYSTEM DEVELOPMENT METHODOLOGY



Note: Numbers of systems shown in parentheses.



alternatives using more detailed and technical conclusions from the assessments. Second level screening criteria were then applied to identify the more "reasonable" system alternatives.

Finally, a third level of screening was performed to identify those system alternatives that provided for more than one technology for residuals management.

C. PERTINENT FINDINGS FROM THE ASSESSMENT STUDIES

The key findings from the recently completed draft reports on Characterization of Residuals, Assessment of Technologies, and Transport Assessment, along with pertinent information from previous or on-going studies, form the basis for the systems development and screening procedures outlined herein. The reader is referred to these reports for detailed information. A synopsis of the information presented in the assessment reports follows.

1. CHARACTERIZATION OF RESIDUALS. The Draft Report on Characterization of Residuals projected the quantity and quality of residuals that will be generated through the design year 2020. Information contained in the report reflects a review of data from a number of previous reports and is supplemented with more recent data from the secondary treatment facilities planning study (STFP), and data gathered from other agencies. Quantity and quality projections are presented for raw sludge (primary, secondary and combined), digested sludge (primary and combined), sludge based products (compost and ash), and minor residuals (grit, screenings and scum).

The influent concentrations of priority pollutants to the MWRA treatment plants are much lower than in other major metropolitan publicly owned treatment works (POTWs) that service a diversified industrial base. These influent concentrations are comparable to influent concentrations at other POTWs that have either a small industrial component or an effective pretreatment program in operation. Limited quantities of volatile organic, acid extractable, base-neutral extractable or pesticides are anticipated in the influent wastewater to the MWRA treatment plant. An assessment to determine if major differences in wastewater quality exist between the current North system

(Deer Island) and South system (Nut Island) did not identify significant variations. Therefore, segregated treatment of North and South system flows is not warranted.

A major portion of the priority pollutant metals discharged to the MWRA treatment facility are expected to partition to the raw sludges. Due to the generally greater metals removal efficiency of the secondary treatment process, and to the fact that smaller quantities of secondary sludge are projected in comparison to primary sludge, metals concentrations in secondary sludge are projected to be higher than in the primary sludge. Both raw primary and raw combined (primary plus secondary) sludge compost are expected to be categorized as a Type II material, although the primary compost is of a higher quality. As a result of the higher quality of primary sludge-based compost compared to combined sludge-based compost, segregated treatment of primary and secondary sludges may be warranted.

Leachate analyses using the extraction procedure toxicity test (EP toxicity) were carried out for raw primary dewatered sludge, primary digested sludge, finished compost, grit, screenings, and scum to determine whether any of the residuals would be considered hazardous under current federal EPA regulatory criteria. The results of the analyses indicated that all of the residuals are non-hazardous. A proposed leachate quality test method, the toxicity characteristic leaching procedure (TCLP), which addresses the leachate quality of both metals and organics, was performed on dewatered primary sludge as part of this study and a number of scum samples as part of a previous study. The results showed no positive occurrences for any of the organic priority pollutants for the dewatered primary sludge. Several of the leachate samples for the scum did have positive occurrences of organic compounds. Depending on the final land disposal regulations promulgated by EPA, it is possible that land disposal of the MWRA raw scum may be prohibited, thus requiring a means of disposal other than landfilling or that a stabilization process be used prior to land disposal.

2. ASSESSMENT OF TECHNOLOGIES. The Assessment of Technologies evaluated a number of technologies for future use by the MWRA in its

long-term management of wastewater treatment plant residuals. Eight major technologies were evaluated as independent technology blocks without consideration of siting and transportation issues. These eight major technologies included: composting and compost distribution; combustion, energy recovery, and ash disposal; landfilling; co-composting and compost distribution; co-combustion and ash disposal; ocean disposal; sludge oxidation and ash disposal; and combustion at sea. The major technologies classified as viable for the management of MWRA residuals are:

- o landfilling
- o composting and compost distribution
- o combustion, energy production and ash disposal

The long-term implementation of a landfilling technology requires the acquisition of a dedicated landfill site. Landfilling is considered an appropriate technology for the disposal of sludge, combustion related ash, and the minor residuals grit, scum and screenings. Gross area requirements for landfilling varied depending on the specific option evaluated. A 20-year sludge landfill requires 1400 to 5000 acres while landfilling of grit and screenings requires approximately 100 acres. If combustion of 100 percent of the combined sludge is implemented, an additional 100 acres is required. Mitigation of environmental impacts associated with landfilling can be provided through the use of double liners, surface drainage control, leachate collection and treatment, groundwater monitoring, and gas collection.

The result of sludge composting is the production of a stabilized, humus-like product that can be used, as a soil amendment, for erosion control, as a mulch, or other soil-like products. Compost processing area requirements vary with the amount of sludge composted, the type of sludge composted (raw or digested), and the compost system employed (reactor or nonreactor). Area requirements vary from 6 acres for digested primary sludge using a reactor system, to 55 acres for combined raw sludge using a nonreactor system. Composting scum in conjunction with sludge may reduce the quality of the finished product, but should not make it unmarketable. Provisions for removing or treating plastics

and floatables associated with the scum must be addressed. The minor residuals of grit and screenings, however, are not recommended for processing with sludge in a compost operation since these detract from the marketability of the final compost product. Plastics, floatables, grit, and screenings generated would require disposal in a landfill.

Sludge combustion significantly reduces the volume of residual material for final disposal and provides a source of waste heat for the subsequent production of energy. Volume reductions in excess of 92 percent can be achieved in combusting dewatered sludge at 30 percent solids to final ash. The technology proposed for an MWRA combustion facility represents a new generation of combustion equipment to meet stringent emissions control and energy efficiency objectives. The emissions control technology recommended for the Authority has been successfully used in the power industry for many years. Combustion facilities include waste heat recovery and energy production facilities, air emissions control equipment, and ash conditioning and handling facilities. Process modifications to accommodate the combustion of grit, screenings and scum may be feasible, although little volume reduction for grit is anticipated. Land area requirements for the combustion facilities for the combined primary and secondary sludge are approximately two acres.

Support technologies are required for the successful implementation of major technologies. Detailed information was developed for thickening, anaerobic digestion, dewatering, thermal conditioning, and chemical treatment. From information presented in the draft report on Assessment of Technologies, these support technologies can be linked with major technologies to define residuals system alternatives. The exact combination of support technologies in conjunction with the major technologies will be further defined in the Candidate Options Evaluation. Of all the support technologies evaluated, anaerobic digestion has the most significant impact on facility size and final utilization options. Anaerobic digestion can be used for stabilization of primary and combined sludges. Anaerobic digestion of secondary sludge alone has inherent operational and technical problems that

Esignificantly impact digester efficiency and capacity.

3. TRANSPORTATION ASSESSMENT. The Transportation Assessment evaluated the feasibility and practicality of transporting a variety of residuals (liquid sludge, thickened sludge, dewatered sludge, compost and amendment, ash, and minor residuals) from the proposed MWRA wastewater treatment facilities on Deer Island by four basic transportation modes (barge, pipeline, rail and truck). Given the coastal setting of the Deer Island facilities, particular attention was paid to transportation systems capable of satisfying on-island, on-water, and on-land transportation needs.

Of the on-water modes, thickened sludge transport via liquid barge is preferred to bulk, container, or truck barging of dewatered sludge or compost and amendment. However, if combustion on Deer Island is employed, truck on barge transport of ash and minor residuals results in the least on-water and subsequent on-land transportation requirements. Dewatering or composting operations on-island increase on-water system transportation requirements. For instance, it is projected that both barge transport of combined digested and thickened liquid sludge (solids content of about six percent) and container barge transport of dewatered sludge would require 9 barge trips per week. However, the container barge option for transporting dewatered sludge would also necessitate the construction of cranes, other support equipment, and approximately 120 to 168 containers for handling the dewatered sludge. Pipeline transport of liquid sludge from Deer Island to a coastal location is considered viable, but must be evaluated on a site-specific basis. Hazardous materials are present in certain Boston Harbor bottom sediments, and a cross-harbor pipeline route and construction method which disturbs these sediments will raise environmental issues which may be difficult to resolve.

Of the on-land transport alternatives, direct transport of dewatered sludge or finished compost through Winthrop would have major transportation requirements and environmental impacts. Transport of ash and minor residuals through Winthrop is not preferred due to the availability of other transport options. This is consistent with the

commitment of MWRA and the Executive Office of Environmental Affairs to mitigate transportation impacts through Winthrop during the construction phase on Deer Island and once the new treatment facilities are operational. Sludge dewatering at a coastal location would greatly reduce the transport requirements associated with on-land transportation to an in-land processing and/or disposal location. Bulk rail transport would have less of an impact than direct truck transport through the urban area, however, the availability of a rail system to effectively serve the coastal and in-land sites can only be determined on a site specific basis. Pipeline transport of liquid sludge may be possible from a coastal location to an in-land site, however, this alternative is best evaluated on a site specific basis. As in the on-water transport segment, truck transport of ash has the least transportation requirements of all on-land alternatives. Regardless of the transport alternatives evaluated, each has associated with it the requirement of land area for either pipeline corridors or transfer stations that must be addressed.

D. PERTINENT INFORMATION FROM RELATED PLANNING ACTIVITIES

In addition to the assessment reports described above, other current and previous planning efforts that the development of system alternatives draw from include:

- o Deer Island Secondary Treatment Facilities Plan (ongoing)
- o Water Transport Facilities Plan (nearing completion)
- o Interim/Mid-Term Privatization Assessment (ongoing)
- o Compost Marketing Study (completed)

1. DEER ISLAND SECONDARY TREATMENT FACILITIES PLAN. Preliminary layouts prepared by the Authority's STFP consultant and coordinated with the RMFP consultant indicate that the acreage available on Deer Island for residuals handling facilities is in the range of 20 acres at the southern end of the island. Current planning also indicates that grit and screenings will be loaded into containers that can be removed from the island by truck on ferry (see Water Transport discussion below). A limited amount of power generation is anticipated to occur on the island

to supplement regular electrical service during peak usage periods. If anaerobic digestion facilities are to be located on Deer Island, all of the available digester gas could be used as a fuel source for the engine-driven generators. If no digestion occurs on Deer Island, the amount of imported fuel oil to the island may be increased.

2. WATER TRANSPORT FACILITIES PLAN. Roll on/roll off piers are to be built on the west side of Deer Island to facilitate the movement of materials, equipment, and personnel onto the island during construction and operation of the new treatment works. Ferries have been selected for the water transport system. At least one, and perhaps two, on-shore pier facilities for this system will be identified and procured by the Authority. At least a portion of this system will be kept in service beyond the construction period to transport ongoing operational supplies to the island. This marine-based supply system would be suitable for transporting from the island grit and screenings, and potentially ash from combustion facilities, and/or composted sludge.

The piers will be very congested during the construction period, beginning in about 1990 and continuing until late 1999. Any substantial use of these piers for residuals transport during construction of the treatment plant would likely be difficult to accommodate. However, the piers could be adapted for residuals transport upon completion of the plant construction.

3. INTERIM PRIVATIZATION PROCUREMENT. The MWRA has concluded that it will likely need assistance from the private sector to meet the court-ordered deadline for commencing land-based sludge disposal by December 1991. Therefore, the Authority has begun a process to first shortlist, then solicit priced proposals from qualified firms for sludge conveyance, processing, and disposal services on an interim basis. A contract award is anticipated to be made to one or two firms during August, 1987, with services commencing as soon as the firm or firms can complete the necessary construction and permitting--probably in 1990. The contracted services will continue until 1995, or whenever the long-term residuals management facilities are available for use.

Under the Authority's primary plan, the contractor(s) will be

required to construct temporary liquid loading facilities at both Deer and Nut Island. No processing will be allowed on either island and any facilities constructed to facilitate the interim services will be of a temporary nature, to be dismantled after the contract period ends. The MWRA may choose to leave the temporary loading facilities at Deer Island in place until the end of the treatment plant construction in 1999, at which time the sludge loading operation (if applicable) could be consolidated into the permanent piers.

Under its secondary plan, the MWRA has invited alternate proposals that would allow limited processing, such as thickening, dewatering, and chemical conditioning, on Deer Island.

4. COMPOST MARKETING STUDY. The principal purpose of the compost market study was to estimate the extent and nature of the probable market for any sludge compost produced by future sewage treatment facilities of the MWRA. Specific markets were identified and interviews and questionnaires prepared. The information provided by the interviews and questionnaires was used to project potential compost demand in the MWRA service area.

Inventories of land in the counties of Essex, Middlesex, Suffolk, Norfolk, and Plymouth were also used to identify the compost market demand. For each category of land use, estimates were made of potential compost application rates, the frequency of application, the percentage of area receiving compost, and the compost quality required. This information was used to estimate the compost demand based on land use.

A comparison of projected compost production and projected compost market demand indicates that the production could exceed demand if both primary and secondary sludges were composted. This conclusion is reasonable in that a mature urban area, such as the MWRA service area and surrounding communities, would have a defined compost market for the traditional uses of compost, and this market would not be subject to the dynamics of a growing population. For this reason it may be necessary to consider composting only a portion of the total sludge production.

E. FIRST LEVEL DEVELOPMENT AND SCREENING OF ALTERNATIVES

The methodology section describes the general framework under which the system alternatives are developed and evaluated. The first level

component of this methodology is the development and screening of generic systems. The use of generic systems simplifies defining all possible combinations of technologies, general site types and residuals.

1. DEVELOPMENT OF GENERIC SYSTEMS. As shown in Figure 1-3, the three elements that are incorporated in developing generic systems are the viable technologies for treating and disposing of residuals, the general site types for residuals processing and disposal facilities, and the types of residuals requiring processing and/or disposal. Four first level development criteria were identified in order to develop generic systems. These are:

1. Composting and compost distribution; combustion, energy recovery and ash disposal; and landfilling are viable major technologies for ultimate disposal of sludge.

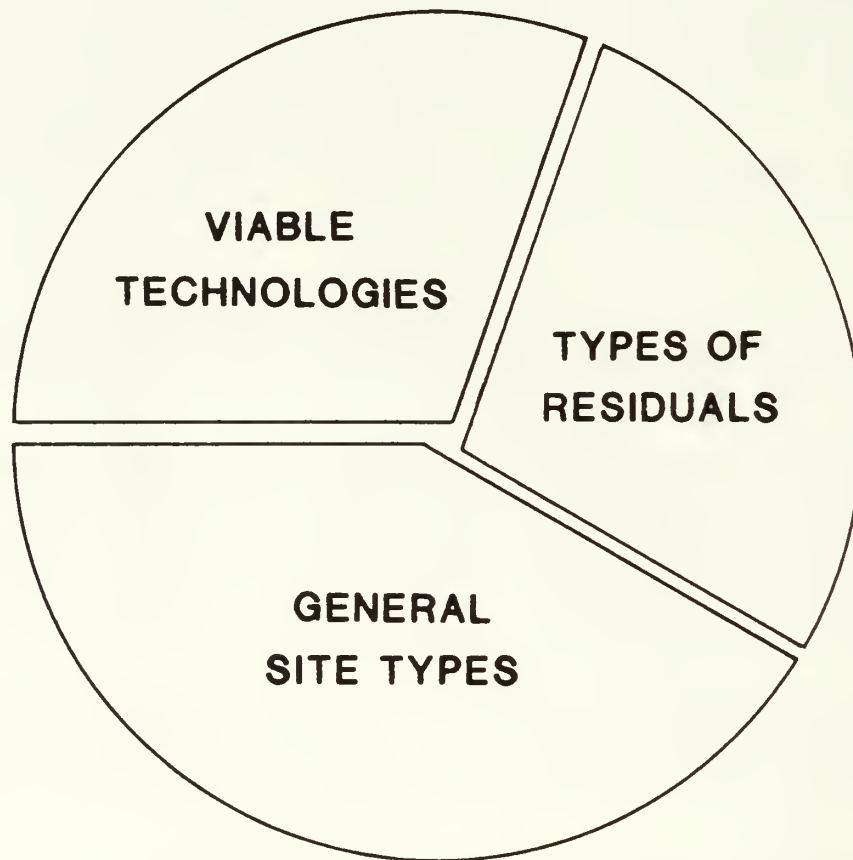
The Assessment of Technologies identified that, of the eight major technologies evaluated, composting and compost distribution; combustion, energy recovery and ash disposal; and landfilling are viable major technologies for implementation. In the absence of siting constraints, each technology could be used to dispose of or utilize all or a portion of the sludge and scum generated by the MWRA treatment plants.

2. Systems should be developed around the general siting areas of: the location of the wastewater treatment facility as the point of origin of the residuals (Deer Island), coastal sites, and inland sites.

Rather than using sites to drive the development of candidate options, a systems approach is established where a number of logical "systems" for the management of MWRA's treatment residuals are defined. The definition of system alternatives involves consideration of technology, transportation, and residuals characteristics.

Other than general locational factors, system alternatives do not require the identification of sites. Therefore, these systems define the types of materials handling and processing that would be accommodated on Deer Island, at a coastal site, and at one or more inland sites.

Each of these general site types could accommodate a whole range of activities from no residuals processing to major processing and/or disposal of residuals. This approach allows for the development of candidate options around a variety of existing site possibilities.



**ELEMENTS IN FORMULATING
GENERIC SYSTEMS**

**Figure
1-3**

3. Landfilling is a viable technology for the disposal of grit, screenings, and ash. Each system alternative must provide and give priority to landfill capacity to accommodate the projected quantity of grit and screenings, and if combustion is an element of the system alternative, the ash generated.

From the Assessment of Technologies, combustion of grit and screenings in combination with dewatered sludge is not a well established practice. Operational considerations and different process requirements including materials handling and combustion chamber design are required for the combustion of grit, and screenings. If these operational and equipment considerations can be adequately addressed, then system alternatives that incorporate combustion will be evaluated in the context of combusting grit and screenings. However, it should be noted that the volumetric reduction projected for the combustion of grit is significantly less than that projected for sludge.

Composting of grit and screenings is not a recommended practice. The aesthetic appearance of the finished compost is an important factor in the marketing and distribution of the compost. Compost that contains foreign objects, such as those from grit and screenings significantly detracts from its marketability.

For the present evaluation, it is conservatively assumed that all system alternatives must provide a landfill for the disposal of grit and screenings.

4. Each of the three viable major technology alternatives are capable of adequately treating and/or disposing of scum.

As noted in the Assessment of Technologies report, scum is suitable for processing in landfilling, combustion and composting. The Residuals Characterization study concluded that scum is a non-hazardous material as defined by the EP toxicity test, and is suitable for landfilling. Preliminary results for the recently developed TCLP analysis did indicate the presence of several organic compounds in the extract from scum samples. Verification of the presence and subsequent leaching of any toxic organic compounds from the MWRA scum may necessitate chemical fixation as a pretreatment step prior to land disposal. Since scum generally has a high organic and low moisture content, it is readily combustible. Due to its high volatile content, its contribution to ash production is negligible. Composting scum with primary or secondary sludge may reduce the quality of the finished product, but should not make it unmarketable assuming the plastics and other floatables associated with the scum are either removed or shredded prior to the composting operation. In addition, the digestion of scum in combination with raw sludge is an appropriate treatment technology. It is recognized that the current digesters are experiencing difficulties with handling scum, however it is felt

that if proper mixing and retention times are maintained, that the combined treatment of sludge and scum should not warrant any special treatment. Further evaluations will be undertaken to assess the combined treatment of sludge and scum. It is recognized that certain preprocessing support technologies may be necessary when implementing these system alternatives. Because each viable technology can process and dispose of scum along with sludge, the appropriate treatment of scum will be considered after the system alternatives are developed.

The development of generic systems was conducted in three steps.

- o First, combinations of technologies and general site types were identified.
- o Second, combinations of technologies and residuals to be treated and disposed of were developed.
- o Third, the first and second set of combinations were combined to generate all possible combinations of technologies, general site types, and residuals, to form generic systems.

By applying the first two of the four criteria identified above, a total of 63 major technologies and general locations are possible. This is the result of systematically combining a single technology with each possible site location, then two technologies with the possible combinations of sites, and finally the possible mixes of three technologies in conjunction with the combination of sites. Table 1-1 summarizes the possible mixes of the three viable technologies with the three general site types for a total of 63 combinations. For illustrative purposes, reference number 59 in Table 1-1 indicates that a portion of the residuals from the MWRA treatment facilities would be landfilled at an inland site, a portion of the residuals would be composted at a coastal site, and the remainder of the residuals would be combusted at a coastal site.

The Residuals Characterization report identified four categories of residuals that must be addressed in the RMFP. These are:

TABLE 1-1

POSSIBLE MAJOR TECHNOLOGY
GENERAL LOCATION COMBINATIONS

REFERENCE NUMBER	LANDFILL	COMPOST	COMBUSTION	REFERENCE NUMBER	LANDFILL	COMPOST	COMBUSTION
1	DEER IS.	-	-	33	-	COASTAL	INLAND
2	COASTAL	-	-	34	-	INLAND	DEER IS.
3	INLAND	-	-	35	-	INLAND	COASTAL
4	-	DEER IS.	-	36	-	INLAND	INLAND
5	-	COASTAL	-	37	DEER IS.	DEER IS.	DEER IS.
6	-	INLAND	-	38	DEER IS.	DEER IS.	COASTAL
7	-	-	DEER IS.	39	DEER IS.	DEER IS.	INLAND
8	-	-	COASTAL	40	DEER IS.	COASTAL	DEER IS.
9	-	-	INLAND	41	DEER IS.	COASTAL	COASTAL
10	DEER IS.	DEER IS.	-	42	DEER IS.	COASTAL	INLAND
11	DEER IS.	COASTAL	-	43	DEER IS.	INLAND	DEER IS.
12	DEER IS.	INLAND	-	44	DEER IS.	INLAND	COASTAL
13	DEER IS.	-	DEER IS.	45	DEER IS.	INLAND	INLAND
14	DEER IS.	-	COASTAL	46	COASTAL	DEER IS.	DEER IS.
15	DEER IS.	-	INLAND	47	COASTAL	DEER IS.	COASTAL
16	COASTAL	DEER IS.	-	48	COASTAL	DEER IS.	INLAND
17	COASTAL	COASTAL	-	49	COASTAL	COASTAL	DEER IS.
18	COASTAL	INLAND	-	50	COASTAL	COASTAL	COASTAL
19	COASTAL	-	DEER IS.	51	COASTAL	COASTAL	INLAND
20	COASTAL	-	COASTAL	52	COASTAL	INLAND	DEER IS.
21	COASTAL	-	INLAND	53	COASTAL	INLAND	COASTAL
22	INLAND	DEER IS.	-	54	COASTAL	INLAND	INLAND
23	INLAND	COASTAL	-	55	INLAND	DEER IS.	DEER IS.
24	INLAND	INLAND	-	56	INLAND	DEER IS.	COASTAL
25	INLAND	-	DEER IS.	57	INLAND	DEER IS.	INLAND
26	INLAND	-	COASTAL	58	INLAND	COASTAL	DEER IS.
27	INLAND	-	INLAND	59	INLAND	COASTAL	COASTAL
28	-	DEER IS.	DEER IS.	60	INLAND	COASTAL	INLAND
29	-	DEER IS.	COASTAL	61	INLAND	INLAND	DEER IS.
30	-	DEER IS.	INLAND	62	INLAND	INLAND	COASTAL
31	-	COASTAL	DEER IS.	63	INLAND	INLAND	INLAND
32	-	COASTAL	COASTAL				

- o Raw Sludges - the treatment of raw primary, raw secondary or the combination of raw primary and secondary sludges.
- o Digested Sludges - the treatment of digested primary sludge, or the combination of digested primary and secondary sludges.
- o Sludge-Based Products - the distribution of finished compost and the disposal of sludge ash.
- o Minor Residuals - specifically screenings and grit from a number of pump stations, CSO facilities and the headworks at the Nut Island and Deer Island treatment plants, and scum from both the primary and secondary treatment facilities.

In developing system alternatives, recommendations for the treatment and/or disposal of sludge-based products and minor residuals are incorporated in criteria 3 and 4 established above. The impact of these criteria is that all systems developed must accommodate land disposal of grit, screenings, and, if applicable, ash. This minimum need should be fulfilled before consideration is given to assigning landfill capacity to other residuals, such as sludge, for which alternate treatment and disposal technologies are available. Segregated treatment of scum is not anticipated (other than possible preprocessing support technologies such as screening to remove plastics and floatables) at this time. This leaves raw and digested sludges as the variable residuals to be incorporated into the development of generic systems. Raw and digested sludges have significantly different characteristics which impact residuals treatment processes and transportation systems. Therefore, these sludges are evaluated as separate residual types.

Combining the viable sludge technologies (landfilling, composting and combustion) with the residual types requiring treatment (raw sludge or digested sludge) yields 26 unique possibilities as detailed in Table 1-2. As an example, reference number 17 in Table 1-2 indicates that a portion of the raw sludge from the MWRA treatment facilities would be combusted, and the remaining sludge would first be digested, then composted. Similar to the process for evaluating the 63 combinations of technologies and general site locations, the procedure for establishing

TABLE 1-2

POSSIBLE MAJOR TECHNOLOGY
WASTE TYPE COMBINATIONS

REFERENCE NUMBER	LANDFILL	COMPOST	COMBUSTION
1	RAW	-	-
2	DIGESTED	-	-
3	-	RAW	-
4	-	DIGESTED	-
5	-	-	RAW
6	-	-	DIGESTED
7	RAW	RAW	-
8	RAW	DIGESTED	-
9	DIGESTED	RAW	-
10	DIGESTED	DIGESTED	-
11	RAW	-	RAW
12	RAW	-	DIGESTED
13	DIGESTED	-	RAW
14	DIGESTED	-	DIGESTED
15	-	RAW	RAW
16	-	RAW	DIGESTED
17	-	DIGESTED	RAW
18	-	DIGESTED	DIGESTED
19	RAW	RAW	RAW
20	RAW	RAW	DIGESTED
21	RAW	DIGESTED	RAW
22	RAW	DIGESTED	DIGESTED
23	DIGESTED	RAW	RAW
24	DIGESTED	RAW	DIGESTED
25	DIGESTED	DIGESTED	RAW
26	DIGESTED	DIGESTED	DIGESTED

the 26 technology/waste type combinations is again a systematic iteration to ensure that all possible combinations are addressed.

The third step in summarizing the matrix of generic systems is to merge the possible major technology/general location combinations (Table 1-1) with the possible major technology/waste combinations (Table 1-2) in a common matrix. The product of combining these two tables represents the universe of generic systems. The result is a compilation of 342 generic systems. These range from a single technology at one location for one residual, to three technologies at three separate locations treating two residuals. The matrix that would describe these 342 generic systems is complex and difficult to present. Therefore, the combinations presented in Table 1-1 and Table 1-2, which are the building blocks used to describe these systems, are used to illustrate the screening process.

2. SCREENING OF GENERIC SYSTEMS. The development of the 342 generic system alternatives entailed using a systematic process. The advantage of using this approach as an initial step in developing generic systems is that the matrix of combinations generated includes all possible combinations of technologies, general site types and residuals. However, in evaluating the universe of generic systems, it is also apparent that a number of these systems are not realistic. For instance, 16 of the possible major technology/general location combinations presented in Table 1-1 include landfilling of sludge at Deer Island. Considering that land availability on Deer Island is very limited, and that the landfilling of sludge may require in excess of 1000 acres, any generic system that incorporates landfilling at Deer Island is not feasible. Therefore, the next step in the screening process was to develop screening criteria so that generic systems which are not feasible due to technical or general siting constraints could be eliminated. For this first level of screening, it is proposed that landfilling of sludge not be employed as a major processing option.

5. Landfilling of sludge is severely restricted by the overriding need to landfill grit and screenings and the limited number of potential sites identified in the existing site bank to provide sufficient acreage for landfilling.

The Technology Assessment concluded that the amount of land required for the implementation of a 20-year capacity sludge landfill could range from 1400 to 5000 acres depending on the sludge characteristics (total solids, quantity, stabilization) and depth of the landfill. This assumes approximately 50 percent of the gross land area is actually employed in landfilling. The remaining land is assumed to be either unusable, or dedicated for buffer, road access, and other support facilities. Preliminary information from the Site Screening Analysis indicates that most of the potential landfill sites are less than 250 acres in size. One 250 acre site would accommodate about one sixth of the sludge generated. Such a site would provide an alternative means of disposal for only eight weeks out of the year for 20 years or only a little more than three years of sludge landfilling. Therefore, no single site exists with sufficient area to accommodate such a large sludge landfill operation or even a significant portion of the sludge. A further review of the existing site bank indicates that including a number of land disposal sites is also not feasible since the available acreage for most sites within the MWRA service area is less than 100 acres. An even greater force for eliminating sludge landfilling as a major technology is that whatever sites are available must first be used to meet the needs for a grit and screenings landfill. In addition, it is likely that land disposal will be needed as a back-up for short-term durations to the selected major residual processing technologies.

In applying the first level screening criteria, a number of possible combinations are eliminated from Table 1-1 and Table 1-2. Applying criterion 5 (sludge landfilling is not viable on Deer Island, at a coastal site, or at an inland location) reduces the possible major technology/general site type combinations (Table 1-1) from 63 to 15. Criterion 5 also reduces the possible major technology/waste type combinations (Table 1-2) from 26 to eight. This leaves 48 generic systems that remain after applying the first level screening criteria as shown on Figure 1-4.

Figure 1-4 is a combination of Table 1-1 and Table 1-2 after the first level screening has been applied. The matrix shown in Figure 1-4 describes the generic systems by technologies, general site types and sludge residuals. Although not shown, all generic systems include the landfilling of grit and screening at an inland site. Thirty-six of the 48 generic systems incorporate a mix of technologies; the other twelve systems rely on a single major technology to treat the sludge from the MWRA treatment plants. An example of a dual technology generic system

GENERAL LOCATION/ TECHNOLOGY COMBINATIONS		WASTE/TECHNOLOGY COMBINATIONS							
		SINGLE TECHNOLOGY SYSTEMS				COMBINATION OF TECHNOLOGIES			
		Alt. # 1	Alt. # 2	Alt. # 3	Alt. # 4	Alt. # 5	Alt. # 6	Alt. # 7	Alt. # 8
ALT. #	COMPOST COMBUSTION	compost-raw combust-NA	compost-dig. combust-NA	compost-NA combust-raw	compost-NA combust-dig.	compost-raw combust-raw	compost-raw combust-dig.	compost-dig. combust-raw	compost-dig. combust-dig.
A	DEER	A1	A2	-	-				
B	COASTAL	B1	B2	-	-				
C	INLAND	C1	C2	-	-				
D	-	-	-	D3	D4				
E	-	-	-	E3	E4				
F	-	-	-	F3	F4				
G	DEER					G5	G6	G7	G8
H	COASTAL					H5	H6	H7	H8
I	INLAND					I5	I6	I7	I8
J	DEER					J5	J6	J7	J8
K	COASTAL					K5	K6	K7	K8
L	INLAND					L5	L6	L7	L8
M	DEER					M5	M6	M7	M8
N	COASTAL					N5	N6	N7	N8
P	INLAND					P5	P6	P7	P8

NA - Not Applicable
 Raw - Raw sludge
 Dig. - Digested Sludge



MATRIX OF GENERIC SYSTEMS - AFTER
 INCORPORATING THE FIRST LEVEL SCREENING CRITERIA

is option I7 from Figure 1-4. This generic system involves inland composting (as identified in the left margin matrix) of digested sludge (alt. #7 from waste/technology combination matrix at the top of the page) and combustion on Deer Island (from left margin matrix) of raw sludge (from matrix at the top of the page). An example of a single technology generic system is option E4, which calls for combustion of digested sludge at a coastal site.

F. SECOND LEVEL DEVELOPMENT AND SCREENING OF ALTERNATIVES

The first step in the second level development and screening procedure is to further develop the 48 remaining generic systems to define support technologies and transportation modes between general site types. An additional level of screening criteria is then applied based on results from the assessment reports.

1. DEVELOPMENT OF SYSTEM ALTERNATIVES. The 48 generic systems include the combinations of major technology blocks for general site types and the various residual types. Potential system alternatives evolve from these generic systems. The focus of the second level development is to present applicable information for defining appropriate support technologies. Eleven second level development criteria are identified and listed below as criteria 6 through 16.

6. Combustion facilities will give preference to autogenous burn conditions using either raw or digested sludge.

By definition, autogenous combustion does not require the continuous addition and operating cost of supplemental fuel. A trade-off exists between the energy of the feed sludge, the mechanical energy required to physically produce a drier sludge cake, and the thermal energy required to evaporate water from the sludge during combustion. The most efficient means of achieving autogenous burn is to use raw sludge feed to the incinerators, as raw sludge has a higher energy value than digested sludge and will reduce subsequent dewatering requirements prior to combustion.

For raw sludges, thermal conditioning in conjunction with mechanical dewatering, or potentially mechanical dewatering by means of a variable volume plate filter press in conjunction with polymer addition, are the processes recommended to meet these requirements. Both systems require fewer processing steps by

eliminating the need for digesters (for that portion of the sludge to be combusted). The thermal preprocessing technology is perceived as a reliable technology and has demonstrated performance. The variable volume plate filter press dewatering option is not as well established, but represents a promising technology in light of recent polymer conditioning developments.

For digested sludges, thermal preprocessing using the multiple-effect evaporation process or polymer conditioning followed by dewatering by a variable volume plate filter press, show promise as viable support technologies for achieving autogenous burn conditions for digested sludges.

7. In evaluating combustion systems which incorporate thermal preprocessing, it is preferred that the thermal preprocessing (thermal conditioning or multiple-effect evaporation) and combustion unit processes are located at the same geographic site.

Having thermal preprocessing operations such as thermal conditioning and multiple-effect evaporation located at the same site with combustion allows the use of waste heat recovery from combustion, as an energy source for the thermal process. In addition, the off-gases from thermal preprocessing are most effectively treated for odor control when returned to the combustion process as combustion air. The net effect of locating these processes at the same site is increased efficiency of both processes.

8. If a system alternative includes anaerobic digestion of all or a portion of the sludge, digestion should take place on Deer Island.

The advantages of locating an anaerobic digestion facility on Deer Island include the following:

- o Sludge volatile solids content is reduced by approximately 40 percent following digestion. This substantially reduces the sludge volume requiring transport off of Deer Island.
- o The digestion process reduces the pathogen content of the sludge and aids in significantly reducing odors. This reduces the nuisances associated with the subsequent transport of sludge.
- o The digestion process is a stabilization process whereby volatile solids are converted to water and gas. This leaves the sludge more stable (or less putrescible) and not subject to rapid changes in its characteristics that otherwise could adversely impact subsequent dewatering processes, if the sludge is to be transported over long distances.

- o Gas from the digestion process can be used in the on-site generators to reduce peak energy demand, thus reducing the amount of supplemental fuel that must be imported to Deer Island.

9. Direct truck transport of residuals from Deer Island to an inland site by a route through Winthrop is not recommended.

Direct truck transport from Deer Island is available only by traveling through the town of Winthrop. Winthrop, which is a one and a half square mile peninsula, is connected to the mainland by two routes, one of which is designated commercial. Traffic congestion is already a major concern along the designated commercial route. In addition, the latter portion of the route to Deer Island passes through a mature residential area.

In the year 2020, the landfill disposal of all the digested dewatered sludge cake would require approximately 33 truck trips per day, 365 days per year. The compost alternative for this same quantity would require approximately 25 truck trips per day of finished compost to be transported off the Deer Island, and would require in excess of 20 additional truck trips per day to furnish the necessary amendment for the compost process. Combustion of this same sludge would require approximately four truck trips per day to remove sludge ash from Deer Island. Regardless of which of the three major technologies is selected, it is estimated that an additional one truck trip per day would be required to transport grit and screenings from Deer Island.

The transportation and environmental impacts of transporting residuals associated with landfilling and composting, through Winthrop, would be significant. While these impacts would be less for transporting ash, grit and screenings, transport of these residuals could easily be accommodated by the transport system proposed for the construction of the secondary treatment facility on Deer Island. The decision not to truck through Winthrop is consistent with other mitigation decisions made with regard to the STFP construction. (Note: The truck trip quantities presented above are lower than those developed in the Assessment of Transportation Alternatives report and reflect later refinements in projected sludge quantities.)

10. If pipeline transport is to be utilized, sludge will be transported as an unthickened liquid.

In an unthickened form, raw primary sludge, raw secondary sludge and combined digested sludge are projected to have total solid contents of 2.0 percent, 0.6 percent and 2.6 percent, respectively. Sludges with a total solids content greater than about 3.0 percent have greater resistance to flow and require more power per unit for pumping. The increase in power required to pump a thickened sludge

(greater than 3.0 percent solids) is not offset by the benefit of pumping a smaller volume. Thickening of the segregated secondary sludge prior to pipeline transport will be evaluated on a case by case basis. Since raw secondary sludge has a solids content of only 0.6 percent, it could conceivably be cost effective to thicken prior to pumping.

11. If thickened sludge is transported from Deer Island, barge transport is recommended.

The Transportation Assessment report indicated that thickening considerably reduces the volume of liquid sludge to be transported and thus increases the available transport options. Three options; liquid barge, container barge, and roll on/roll off (RO/RO) barge using trucks, were considered in the Transportation Assessment. Barging of thickened sludge results in the fewest trips across the harbor in comparison to other options. Liquid barges to carry thickened sludge require the least number of support facilities and equipment. Only one berth or pier is required for liquid barges versus two berths for the RO/RO option. Both container options call for a significant capital expenditure for containers, cranes, and additional land area for transfer of materials. In addition, a liquid barging operation is more easily implemented, will require less operation and maintenance, and virtually no noise will be associated with this option.

12. If raw sludge is transported off of Deer Island, it is preferred that transport is accomplished by a pipeline.

In comparison to barging, pipeline transport offers several important advantages over barge transport of raw sludge. Raw sludge, especially primary, is an extremely odorous substance. Raw sludge would be easily putrescible in the event of significant delays in barge unloading operations. Barging operations such as loading and discharging sludge would involve the displacement and release of a large volume of foul gas from the sludge tanks on the barge, creating a major odor problem. Odor control equipment along with the development of handling procedures would be required to minimize the exposure to this gas. However, a high risk of odor emissions would still exist. The use of a pipeline to transport raw sludge off of the island provides total containment of the sludge. Other advantages of pipeline transport off island include greater reliability due to freedom from weather conditions and labor strikes, and substantially lower labor requirements.

13. Transport of raw sludge from a coastal site to an inland site by vehicle is not recommended.

It is recommended that raw sludge not be transported inland from a coastal site by vehicle in order to prevent the potential nuisance conditions associated with this material from impacting affected

communities. Pipeline transport offers a better alternative for conveying raw sludge inland in comparison to trucking or rail transport because a pipeline provides an enclosed system for better control of odors and other nuisance conditions.

14. Transport of dewatered sludge cake from Deer Island is not a recommended component of any system alternative.

Two on-water transport options, container barge and roll on/roll off (RO/RO) barge using trucks were evaluated in the Transportation Assessment. Sludge cake is a difficult residual to handle and this difficulty precludes the use of bulk barges. Thus, the volume reduction gained in the dewatering process is offset by the inability to handle dewatered sludge cake in bulk in a marine operation.

Compared to container barges, RO/RO barges with trucks require more berths and barges and twice the number of weekly barge trips. However, the investment in loading and unloading equipment is considerably less with the latter.

On-water transportation requirements are actually increased by either of the two dewatered sludge transport options compared to transport of thickened sludge by liquid barge. While the single-stack container barge option is practically the same in the number of weekly barge trips, the required investment in container-handling equipment, facilities, and the labor to operate these facilities, which are not projected for incorporation during the construction phase, are considerably greater than for liquid barging. For instance, the transport of the combined digested sludge that is dewatered is projected to require the same number of barge trips (9) as the thickened liquid option, but it also will necessitate the cranes and other support equipment and approximately 120 to 168 containers for handling the dewatered sludge.

15. The transport of grit and screenings from Deer Island by ferry is recommended. If ash is to be removed from Deer Island, it is recommended that it be moved in the same manner.

In order to remove grit, screenings and ash from Deer Island, the use of roll on/roll off (RO/RO) trucks on ferries is recommended. The advantage of this system is the ability of ash, grit and screenings to be transported by the same RO/RO vehicle used during the on-island construction period. The use of this vehicle precludes the need for any modifications to the construction piers, since these piers are being designed for this type of RO/RO vehicle. The removal of screenings and grit from Deer Island, using this transport technology, could take place during the entire construction period (1990 - 2000).

16. The transport of ash, grit and screenings from a coastal site to an inland site is best accomplished by truck.

Screenings and grit (and ash, if combustion takes place on Deer Island) will likely be coming off Deer Island by truck on supply boats. It would be inefficient and impractical to then unload these trucks for loading onto rail cars. Given the quantities involved and the flexibility inherent in trucks, truck transport of ash, screenings and grit is preferred over the rail transport of these residuals. Rail is a superb carrier of bulk goods over long distances, but the quantities and distances anticipated with these residuals do not justify the use of rail. Trucks are the preferred inland transport option for ash, screenings and grit.

2. SCREENING OF SYSTEM ALTERNATIVES. The next section screens the 48 system alternatives that survived the first level screening analysis and were further defined by the development criteria presented immediately above (criteria 6 thru 16). The following five second level screening criteria (referenced below as criteria 17 through 21) were formulated from detailed technical information presented in the three assessment reports.

17. If sludge composting is part of a system alternative, it is preferred that primary or combined sludge be used. Composting of secondary sludge alone is not recommended.

The preference to use primary or combined (primary plus secondary) sludge is based on two reasons identified in the Assessment of Technology; processing and product quality. Composting of raw secondary sludge by itself is not typically practiced for process reasons. Sludge composting requires a cake solids of approximately 20 percent in order to promote aerobic composting. Solids much less than 20 percent require increases in amendment quantities. Conventional processes for dewatering secondary sludge yield cake solid contents of between 10 and 15 percent. Including a thermal conditioning step in the process, or using a plate and frame filter press would provide the required solids content, but at a substantially higher cost. Higher cake solids in the range of 20 percent or more can easily be achieved with combined or primary sludge.

In addition to process reasons, sludge quality affects the decision not to compost secondary sludge only. Metals in wastewater have a greater affinity to partition into secondary sludge in comparison to primary sludge. As a result, concentrations of metals such as cadmium and copper are projected to be significantly higher in secondary sludge. A secondary sludge-based compost would be of

lower quality than that of a primary or combined sludge-based compost. Therefore, producing a higher quality compost using primary or combined sludge is preferred.

18. **Anaerobic digestion of secondary sludge alone, or of a combined raw sludge which is predominantly secondary sludge, is not recommended.**

As discussed in the Assessment of Technologies report, operating experience with wastewater sludges containing a significant portion of secondary sludge has shown that excessive foaming typically occurs. This results in reduced digester capacity. In addition, the high ammonia concentrations in the secondary sludge limit the percent total solids that can be fed to the digester to avoid levels of ammonia that are toxic to the anaerobic process. This results in increased digester tankage required to process secondary sludge only, and increased energy requirements for digester heating.

19. **If a pipeline is built across the harbor to convey sludge, barge transport of the sludge is not recommended.**

A significant effort will be required to permit and construct pipelines across the harbor to convey sludge. The number or size of these pipelines has little impact on the overall construction project. For this reason it makes it unnecessary to also employ a barge transport system if a pipeline has been selected for sludge conveyance since the pipeline network will be designed for system redundancy. Regardless of whether the sludge is conveyed by barge or pipeline, grit, screenings, and ash (if applicable) are recommended to be removed from Deer Island by water ferries.

20. **If raw sludge is conveyed off Deer Island, it is recommended that raw primary and raw secondary sludge are conveyed separately and remain segregated.**

The characteristics of raw primary and secondary sludge are significantly different. Raw primary sludge is highly putrescible and, if not processed soon after it is produced, will undergo a process of hydrolysis in which sludge solids begin to solubilize reversing the treatment process by returning the pollutant loading back into the liquid phase. When subsequently separated from sludge solids in a dewatering process, this liquid will contain a very high BOD loading, have a high potential for creating nuisance conditions and require special handling and treatment.

Raw secondary sludge consists primarily of cell mass that is not as biologically active as primary sludge. Therefore, the conditions described above will be much slower to develop.

The major drawback to combining these raw sludge streams is that mixing of the raw primary and raw secondary speeds up the

hydrolysis process. Mixing of the raw sludge will also limit the methods available for subsequent thickening or dewatering as once mixed, they cannot be separated for increased flexibility in sludge processing.

Development criterion 6 identifies the preference for combustion under autogenous burn conditions. On Deer Island, the most practical way to accomplish this is to use the sludge with the highest energy content, ie., raw sludge. This conclusion eliminates seven generic systems (D4, G6, G8, H6, H8, I6 and I8) which call for the combustion of digested sludge on Deer Island for all or a portion of the sludge. This leaves 41 system alternatives for further consideration.

Screening criteria 17 and 18 recommend the use of primary sludge in both the composting and digestion processes. Primary sludge produces a high quality compost and is preferred over blends of compost comprised of secondary sludge. In addition, primary sludge is required for blending with secondary sludge in order for the anaerobic digestion process to operate efficiently. A number of the 41 remaining system alternatives do not satisfy both of these recommendations. A potential conflict for the use of primary sludge occurs in those two technology systems identified in column number 6 (J6, K6, L6, M6, N6 and P6) of Figure 1-4. In all of the column 6 systems, raw sludge is composted and digested sludge is combusted. In order to satisfy criterion 17, it is preferred that primary sludge be composted. This would mean for all column 6 systems, raw primary sludge would be composted and raw secondary would be digested, then combusted. As shown in Figure 1-5, a conflict arises in also satisfying criterion 18, which calls for the digestion of primary sludge with secondary sludge (in other words anaerobic digestion of secondary sludge alone is not recommended). In order to satisfy this criterion for column 6 systems, the raw primary sludge would have to be diverted from the compost process and sent to the digestion process. In fact, this criterion causes the column 6 systems to degenerate to the digestion and combustion of combined primary and secondary sludge (a single technology system). The system alternatives which essentially solve this conflict are those from column 7 of Figure 4 (J7, K7, L7, M7, N7 and P7).

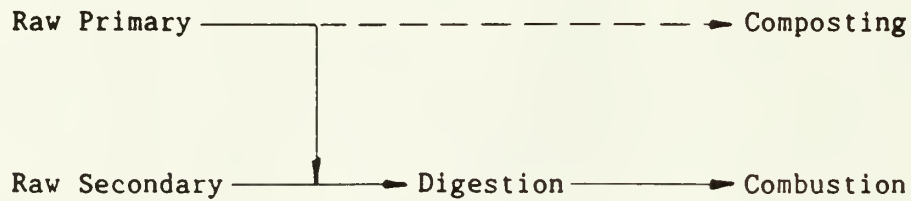
These systems also employ two technologies and process both digested and raw sludge. However, as shown in Figure 1-5, the competition for primary sludge does not exist because digestion is not proposed in tandem with combustion as in the column 6 systems. Instead, the digestion process is used in conjunction with composting of the primary sludge. Therefore, the system alternatives that incorporate digestion with composting of primary sludge (column 7 systems) are more feasible than systems that propose digestion of secondary sludge prior to combustion. The column 6, system alternatives J6, K6, L6, M6, N6 and P6 are not recommended for further consideration.

System alternatives K7, L7, N7 and P7 call for the conveyance of both raw and digested sludge from Deer Island to a coastal or inland site. In these system alternatives, pipelines would be used to convey both sludge types since raw sludge necessitates transport via a pipeline, and barging of digested sludge in conjunction with pipeline transfer of the raw sludge would violate criterion 19 (which discourages more than one mode of on-water transportation for any one system alternative). However, in conveying both digested and raw sludge, segregated pipelines for raw primary, raw secondary, digested and backup support must be provided. In addition, once raw and digested sludge are conveyed to a coastal site for treatment by both combustion and composting, the flexibility of shifting these waste types between processes is severely limited. For instance, in alternative K7, once sludge is digested on Deer Island, then transported off the island, the digested sludge cannot be blended with the raw sludge and combusted using the same preprocessing operations identified for combusting the raw sludge at the coastal site. Likewise, the raw sludge cannot be easily processed with the same equipment used for the digested sludge.

System alternatives K7, L7, N7 and P7 can also be compared to system alternatives K8, L8, M8, N8 and P8, which propose the transfer of only digested sludge from Deer Island. The latter system alternatives accomplish the same processing objectives with increased flexibility in transferring sludge from one technology to another. As both composting and combustion technologies are supported by preprocessing equipment to

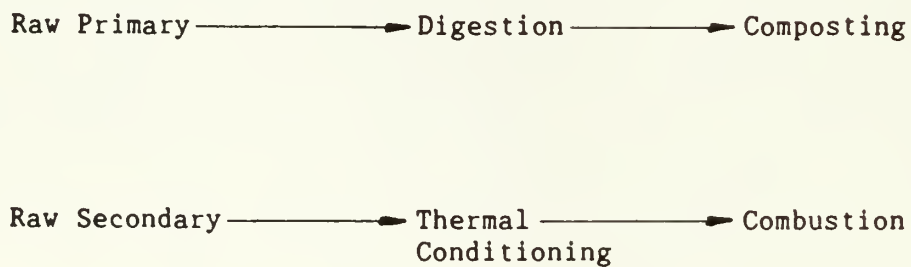
Column 6 Systems *

(competition exists)



Column 7 Systems *

(no competition exists)



—————> Preferred flow of sludge
to satisfy criteria

* Reference Figure 4



**COMPETITION FOR PRIMARY SLUDGE
IN SYSTEM ALTERNATIVES**

**Figure
1-5**

handle digested sludge, it is possible to move a percentage of the sludge from one technology to the other utilizing the same preprocessing equipment. For these reasons, system alternatives K7, L7, N7 and P7 are eliminated from further consideration.

For the 20 remaining dual technology system alternatives, the proposed treatment processes are the same, the only difference being the sites where the various unit treatment processes are located. The 20 system alternatives encompass locating both combustion and composting operations on Deer Island, both technologies at a coastal site, both technologies at an inland site, and a combination of the treatment processes at Deer Island, the coastal site and the inland site. In evaluating these possibilities, it is realized that a number of the alternatives are dependent on substantial acreage being available on Deer Island.

System alternatives J7, J8, M7 and M8 call for digestion of the combined primary and secondary sludge on Deer Island followed by composting of a portion of the digested sludge, also on Deer Island. Preliminary estimates are that 15 acres would be required to accommodate the 24-100 foot diameter anaerobic digesters. Assuming the composting facilities are designed to handle the initial sludge disposal demands (primary sludge from the new primary treatment facilities between 1995 and the year 2000 before the secondary treatment facilities are placed on-line), an additional 20 acres are necessary for the construction of in-vessel composting and storage facilities. The total estimated area requirements including digestion, composting and miscellaneous areas for dewatering, thickening, materials handling and storage on Deer Island is about 35 acres for alternatives J7, J8, M7 and M8.

System alternative G7 includes composting of digested sludge and combustion of raw sludge on Deer Island. Assuming the digesters and composting facilities are designed to handle the initial sludge disposal demands from 1995 to the year 2000, approximately 20 acres are required for the construction of digesters and in-vessel composting facilities. An additional ten acres are necessary to accommodate sludge thickening,

dewatering, thermal conditioning, combustion, storage, and materials handling. The total estimated area requirement for system alternative G7 is about 30 acres. System alternative G5 entails the composting of raw sludge (primary) and the combustion of raw sludge (predominately secondary sludge) on Deer Island. The area requirement for this alternative is approximately 28 acres on Deer Island. As indicated earlier, preliminary layouts prepared by the Authority's STFP consultant and coordinated with the RMFP consultant indicate that the acreage available on Deer Island for residuals processing is in the range of 20 acres at the southern end of the island. Alternatives J7, J8, M7, M8 and G7 are clearly not feasible due to area constraints. System alternative G5 is marginal if engineering measures are employed to minimize the area requirements, but is not recommended because use of such engineering measures will significantly limit the operational flexibility available in order to accommodate both technologies on Deer Island. In addition, system alternatives J7, J8, M7, M8, G7 and G5 include composting on Deer Island which significantly increases the on-water transportation system requirements to handle bulk transport of amendment and finished compost product to and from Deer Island via bulk barge when compared to the remaining system alternatives. Therefore, system alternatives J7, J8, M7, M8, G7 and G5 are not recommended for further evaluation based on area limitations and the on-water transportation system requirements and impacts.

At the conclusion of the second level screening, eleven single technology alternatives and 14 dual technology alternatives survive for further evaluation. These system alternatives are shown on Figure 1-6.

G. THIRD LEVEL SCREENING OF ALTERNATIVES

A third level screening was performed to allow for the use of engineering judgement in recommending the most reasonable system alternatives. The third level screening also serves to reduce the number of system alternatives to be used in forming candidate options.

Having a smaller number of system alternatives is believed advantageous in that it may be desirable to evaluate one or more of the system alternatives at more than one set of sites. Therefore, it is

GENERAL LOCATION/ TECHNOLOGY COMBINATIONS		WASTE/TECHNOLOGY COMBINATIONS									
		SINGLE TECHNOLOGY SYSTEMS					COMBINATION OF TECHNOLOGIES				
ALT. #	COMPOST COMBUSTION	Alt. # 1	Alt. # 2	Alt. # 3	Alt. # 4	Alt. # 5	Alt. # 6	Alt. # 7	Alt. # 8		
		compost-raw combust-NA	compost-dig. combust-NA	compost-NA combust-raw	compost-NA combust-dig.	compost-raw combust-raw	compost-raw combust-dig.	compost-dig. combust-raw	compost-dig. combust-dig.		
A	DEER	A1	A2	-	-	-	-	-	-		
B	COASTAL	B1	B2	-	-	-	-	-	-		
C	INLAND	C1	C2	-	-	-	-	-	-		
D	-	-	-	D3	-	-	-	-	-		
E	-	-	-	E3	E4	-	-	-	-		
F	-	-	-	F3	F4	-	-	-	-		
G	DEER	-	-	-	-	-	-	-	-		
H	COASTAL	-	-	-	-	H5	-	H7	-		
I	INLAND	-	-	-	-	I5	-	I7	-		
J	DEER	-	-	-	-	J5	-	-	-		
K	COASTAL	-	-	-	-	K5	-	-	-		
L	INLAND	-	-	-	-	L5	-	-	-		
M	DEER	-	-	-	-	M5	-	-	-		
N	COASTAL	-	-	-	-	N5	-	-	-		
P	INLAND	-	-	-	-	P5	-	-	-		

NA - Not Applicable
 Raw - Raw sludge
 Dig. - Digested Sludge



MATRIX OF SYSTEM ALTERNATIVES - AFTER INCORPORATING THE SECOND LEVEL SCREENING CRITERIA

quite likely that the number of candidate options will exceed the number of system alternatives.

A third level screening criterion is, therefore, proposed:

21. System alternatives should include two major technologies for the ultimate utilization and/or disposal of sludge.

Support for this criteria is principally based on two factors: (1) a growing trend in this country of treatment entities diversifying their sludge management programs to achieve greater reliability and flexibility; and (2) the desire to implement processing redundancy for sludge disposal.

The use of more than one technology for the utilization and disposal of sludge has recently increased in the wastewater industry, and is especially important to provide reliability and flexibility in a sludge management program the size and complexity of the Authority's. Although often starting with a single disposal option, most of the large metropolitan areas now employ at least two technologies. Examples include: Baltimore, Washington, D.C., Philadelphia, Chicago, Milwaukee, Denver, Las Vegas, Seattle, and Los Angeles. Some of these systems are sized to provide 100 percent capacity with each technology; however, most provide a lesser degree of redundancy. Even without substantial overlap in capacities, two technologies provide a treatment entity with greater flexibility and reliability than would be achievable with a single technology option.

Recognizing that a reliable sludge management program is critical to the continuing operation of a wastewater treatment facility, it is recommended that a backup technology be available that is sufficient to handle six months of sludge production; or, in lieu of a backup technology, storage may be provided. Providing six months storage in a system as large as the MWRA's is a significant but, perhaps, manageable requirement. However, storage is probably not a very good solution to the reliability problem, in a large, complex residuals management system. A better solution would be some combination of storage and alternate technology.

By applying the two technology criterion, the eleven single technology system alternatives shown on Figure 1-6 are eliminated. This leaves a total of 14 dual technologies for further evaluation at the conclusion of the third level screening. These are summarized on Figure 1-7.

I. GENERAL SYSTEMS RECOMMENDED FOR CANDIDATE OPTIONS DEVELOPMENT

The development and screening of system alternatives included two

GENERAL LOCATION/ TECHNOLOGY COMBINATIONS	WASTE/TECHNOLOGY COMBINATIONS									
	SINGLE TECHNOLOGY SYSTEMS					COMBINATION OF TECHNOLOGIES				
	Alt. # 1	Alt. # 2	Alt. # 3	Alt. # 4		Alt. # 5	Alt. # 6	Alt. # 7	Alt. # 8	
ALT. # COMPOST COMBUSTION	compost-raw combust-NA	compost-dig. combust-NA	compost-NA combust-raw	compost-NA combust-dig.		compost-raw combust-raw	compost-raw combust-dig.	compost-dig. combust-raw	compost-dig. combust-dig.	
A DEER	-	-	-	-						
B COASTAL	-	-	-	-						
C INLAND	-	-	-	-						
D - DEER	-	-	-	-						
E - COASTAL	-	-	-	-						
F - INLAND	-	-	-	-						
G DEER						-	-	-	-	
H COASTAL						H5	-	H7	-	
I INLAND						I5	-	I7	-	
J DEER						J5	-	-	-	
K COASTAL						K5	-	-	-	K8
L INLAND						L5	-	-	-	L8
M DEER						M5	-	-	-	
N COASTAL						N5	-	-	-	N8
P INLAND						P5	-	-	-	P8

NA - Not Applicable
 Raw - Raw sludge
 Dig. - Digested Sludge



MATRIX OF GENERIC SYSTEMS - AFTER INCORPORATING THE THIRD LEVEL SCREENING CRITERIA

development and three screening iterations, extending from the initial identification of 342 possible generic systems to the identification of 14 potentially viable system alternatives at the conclusion of the third level screening.

Close scrutiny of the 14 system alternatives indicates that 6 of the systems are nearly identical to others within the 14, with the principal difference being that some of the alternatives call for processing of raw sludge while their counterparts call for processing of digested sludge. Therefore, for purposes of determining siting needs, 12 of the 14 system alternatives can be characterized by six "general system alternatives."

The two remaining systems are raw sludge alternatives and do not have counterparts that utilize digested sludge. They call for taking a portion of the raw sludge off Deer Island to either a coastal site (J5) or an inland site (M5) for combustion and, thus, their viability is contingent on the construction of a pipeline conveyance system to deliver the raw sludge to either of these two processing locations. The feasibility of the pipeline mode of conveyance from Deer Island to a coastal site and from a coastal site inland is currently undergoing detailed analysis as part of the RMFP process. Preliminary results of this analysis indicate that pipeline conveyance to an inland location will be very difficult to accommodate. This makes the viability of system alternative M5 questionable at this point in the planning process and, until the feasibility of constructing a pipeline inland can be demonstrated, system M5 will not be carried forward in the planning process.

Therefore, seven general system alternatives will be carried forward for matching with sites to form candidate options. These are shown on Figure 1-8. A brief description of each follows.

H System Alternatives call for the combustion of raw sludge on Deer Island in conjunction with the composting of either raw sludge (H5) or digested sludge (H7) at a coastal location. For this combination of technologies, wastes, and general site locations, it is anticipated that primary sludge is composted and secondary sludge is combusted. Although

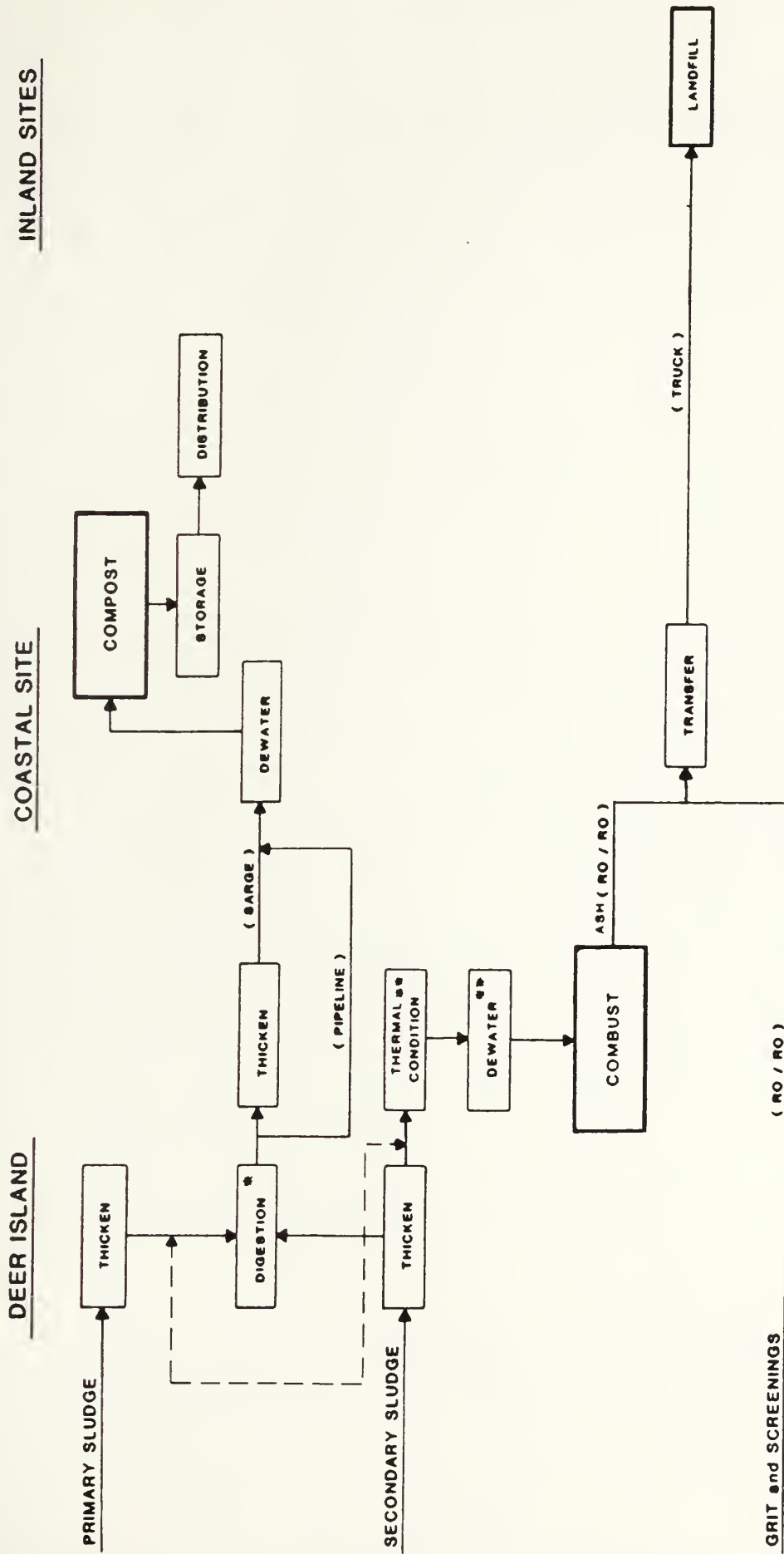
←———— GENERAL LOCATIONS —————→

General System	Possible System Alternatives	Deer Island	Coastal Site	Inland Site
H	H5, H7	Combustion	Composting	-
I	I5, I7	Combustion	-	Composting
J	J5,	Composting	Combustion	-
K	K5, K8	-	Combustion/Composting	-
L	L5, L8	-	Combustion	Composting
N	N5, N8	-	Composting	Combustion
P	P5, P8	-	-	Combustion/Composting



**GENERAL SYSTEMS RECOMMENDED
FOR CANDIDATE OPTIONS DEVELOPMENT**

predominately primary sludge is composted, the system alternative is designed to accommodate flexibility and treatment capacity redundancy by blending secondary sludge with the primary sludge and subsequently composting the combined raw sludge. Similarly, although the combustion process is designed to combust predominately secondary sludge, the system is also designed to allow the flexibility of combustion of primary sludge. Figure 1-9 presents the flow schematic for system alternative H7. The dashed line on the Figure indicates the interconnection between the two unit processes to allow system flexibility. The combustion treatment train entails the thickening of the secondary sludge in conjunction with a percentage of the raw primary sludge (which aids in the handling and subsequent processing steps). The thickened sludge is then either thermally conditioned prior to dewatering or chemically conditioned and dewatered by a plate filter press (Figure 1-9 depicts the thermal conditioning option). The sludge is combusted on Deer Island, and the ash is placed in roll-on/roll-off containers, transported by ferries to a coastal site, then transported by truck to a landfill. The thermal conditioning process (if used) generates a sidestream that is treated separately by anaerobic treatment before being discharged to the liquid stream treatment facilities. Gas from the sidestream treatment units, as well as waste heat from the combustion process, can be used for power production on Deer Island. For system alternative H7, digestion of the primary sludge on Deer Island precedes composting at a coastal location. For system alternative H5, raw primary sludge is transported via a pipeline from Deer Island to a coastal site for composting. The major differences between H5 and H7 is that H5 entails the composting of a raw sludge, and therefore necessitates the construction of a pipeline between Deer Island and the coastal site. System alternative H7 includes the composting of digested sludge, and therefore either barge transport or pipeline transport of the digested sludge from Deer Island to the coastal site is possible. Grit and screenings from Deer Island are transported to a coastal site by ferries, and hauled to a landfill by truck for both system alternatives H5 and H7.



^a Anaerobic digestion includes methane gas recovery and utilization.

^a If feasible, polymer conditioning in conjunction with a plate filter press may be implemented.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.

I System Alternatives include the combustion of raw sludge (predominately secondary) on Deer Island and the composting of either raw sludge (I5) or digested sludge (I7) at an inland location. These system alternatives are similar to system alternatives H5 and H7, with the principal difference being that the composting operation is conducted at an inland site in lieu of a coastal location. Again the notable difference between I5 and I7 is the incorporation of digestion on Deer Island and subsequent composting of primary sludge at an inland location for I7, versus pipeline transport of raw sludge and composting at an inland location for system alternative I5. The viability of system alternative I5 is questionable until the feasibility of an inland pipeline can be demonstrated. Figure 1-10 depicts the flow schematic for system alternative I7.

J System Alternative includes the combustion of a raw sludge (predominately secondary) at a coastal site and composting of a raw (J5) sludge on Deer Island. Figure 1-11 depicts this system alternative.

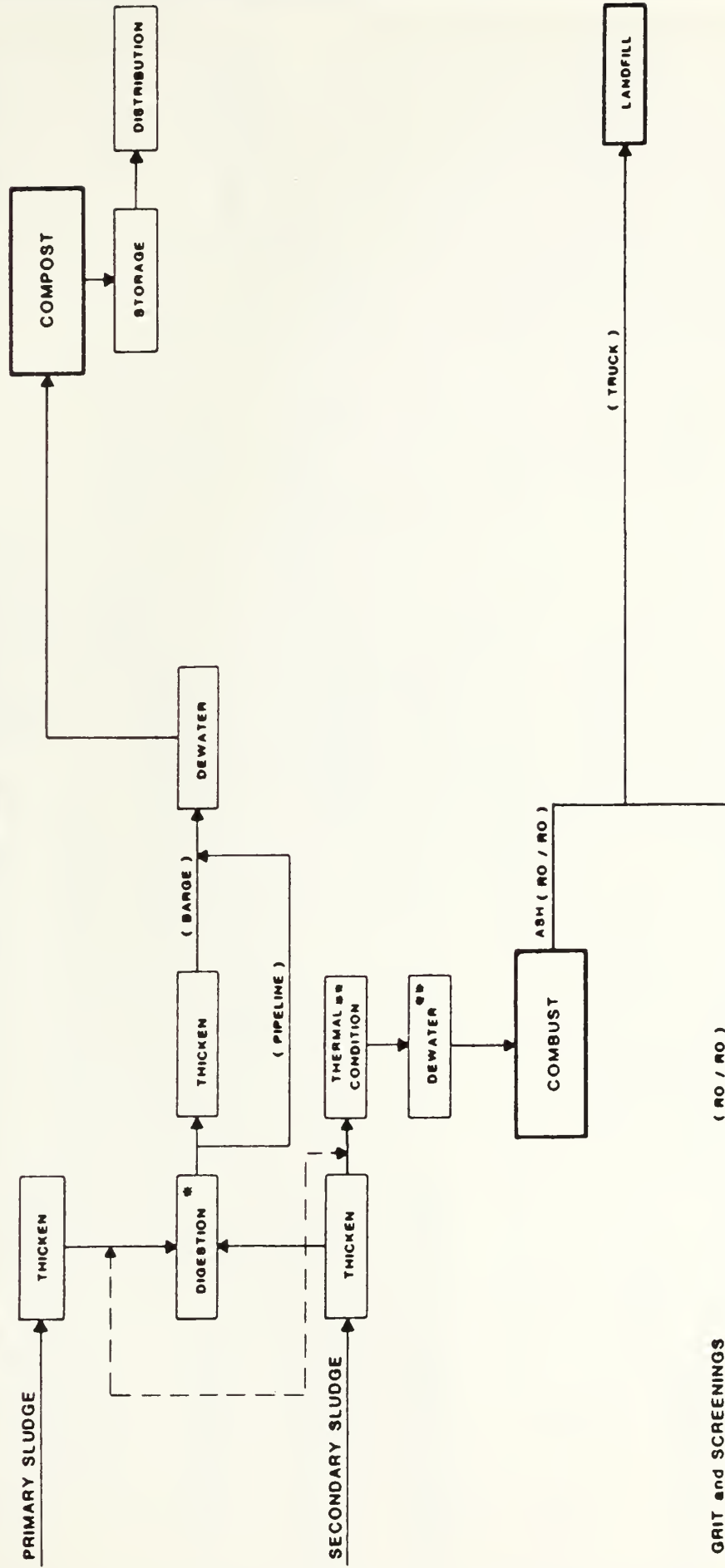
K System Alternatives call for both the combustion and composting of raw sludge (K5) or digested sludge (K8) at a coastal site. Figure 1-12 presents the flow schematic for system alternative K8 which entails the combustion and composting of digested sludge. System alternative K5 does not include digestion, and as such requires segregated pipelines for the transport of raw primary and raw secondary sludge from Deer Island to the coastal processing site. System alternative K8 includes thickening of primary and secondary sludge, digestion of the combined primary and secondary sludge on Deer Island, and either transport by means of a pipeline or bulk liquid barge from Deer Island to a coastal site for dewatering. A portion of the dewatered sludge would be combusted and the remainder would be composted. Grit and screenings from Deer Island are transported by ferry to a coastal location, then transported by truck along with the combustion ash to an inland landfill site.

L System Alternatives call for the combustion of raw sludge at a coastal site in conjunction with the composting of raw sludge at an inland location (L5), or the combustion and composting of digested

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

** If feasible, polymer conditioning in conjunction with a plate filter press may be implemented.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.

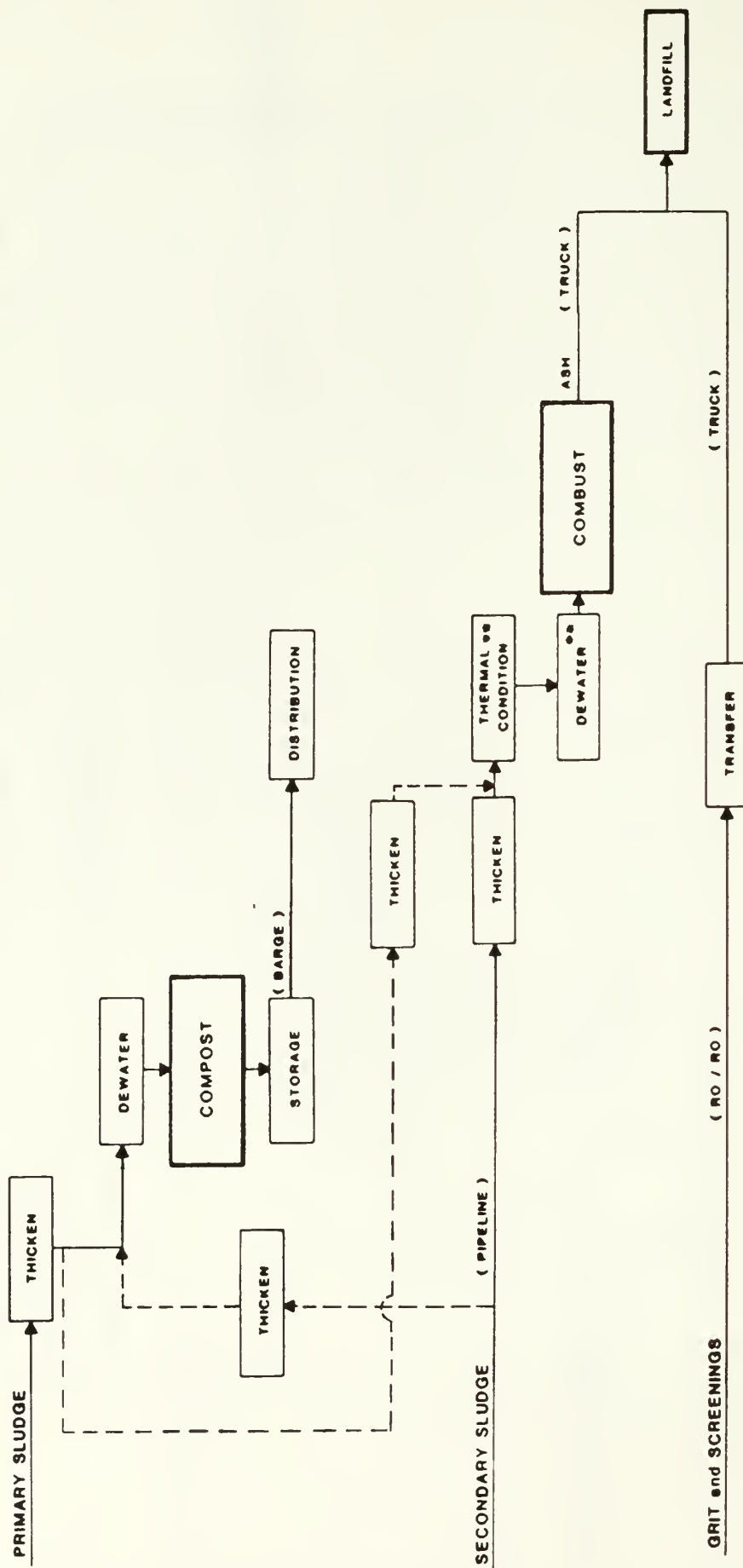


SYSTEM ALTERNATIVE I7

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

** If feasible, polymer conditioning in conjunction with a plate and frame filter press may be implemented.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.

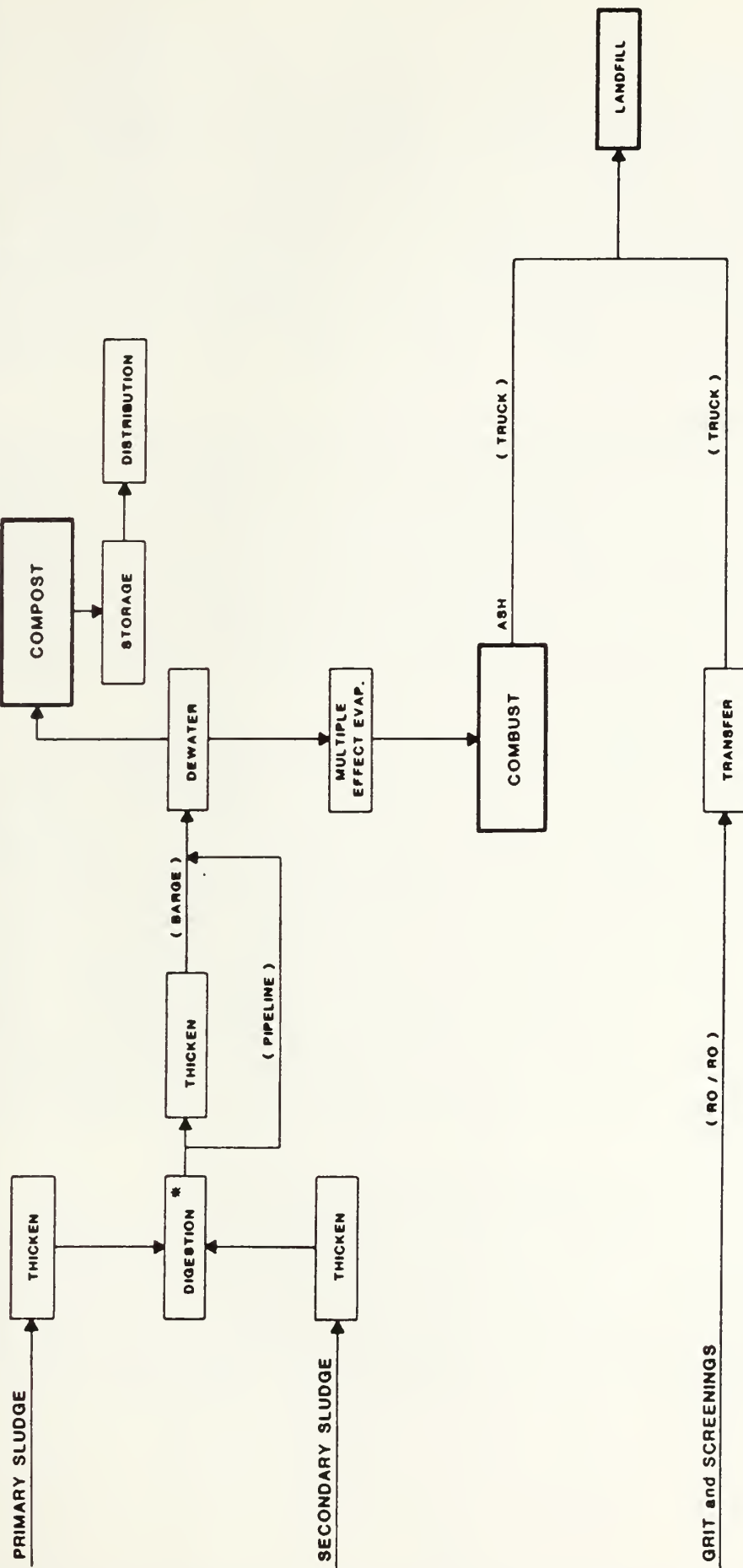


SYSTEM ALTERNATIVE J5

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.



SYSTEM ALTERNATIVE K8

Figure 1-12

sludge at a coastal and inland site, respectively (L8). Figure 1-13 details the flow schematic for the digested sludge treatment option (system alternative L8). A notable difference between system alternatives L5 and L8 is the inclusion of anaerobic digestion in L8. The impacts of digesting the sludge prior to combustion is that more extensive preprocessing is needed to achieve autogenous burn conditions with the lower-energy digested sludge. Figure 1-13 depicts system alternative L8.

N System Alternatives call for composting of a portion of the residuals at a coastal site and combustion of the remainder at an inland location. System alternative N5 entails the composting and combustion of raw sludge; system alternative N8 includes the composting and combustion of digested sludge. The N system alternatives are similar to the L systems, only the locations of the composting and combustion operations are interchanged. Figure 1-14 presents the flow schematic for system alternative N8.

P System Alternatives call for both composting and combustion of either raw (P5) or digested (P8) sludge at an inland site. The P5 system alternative would require the construction of segregated pipelines from Deer Island to the inland processing site. Thus, the viability of this system alternative, like systems I5, L5, and N5, is questionable until the feasibility of an inland pipeline can be demonstrated. The P8 alternative, which is presented on Figure 1-15, includes digestion of the combined primary and secondary sludge on Deer Island. The net result is that the site requirements for processing are the same as alternative P5, but that more flexibility in transportation options is provided.

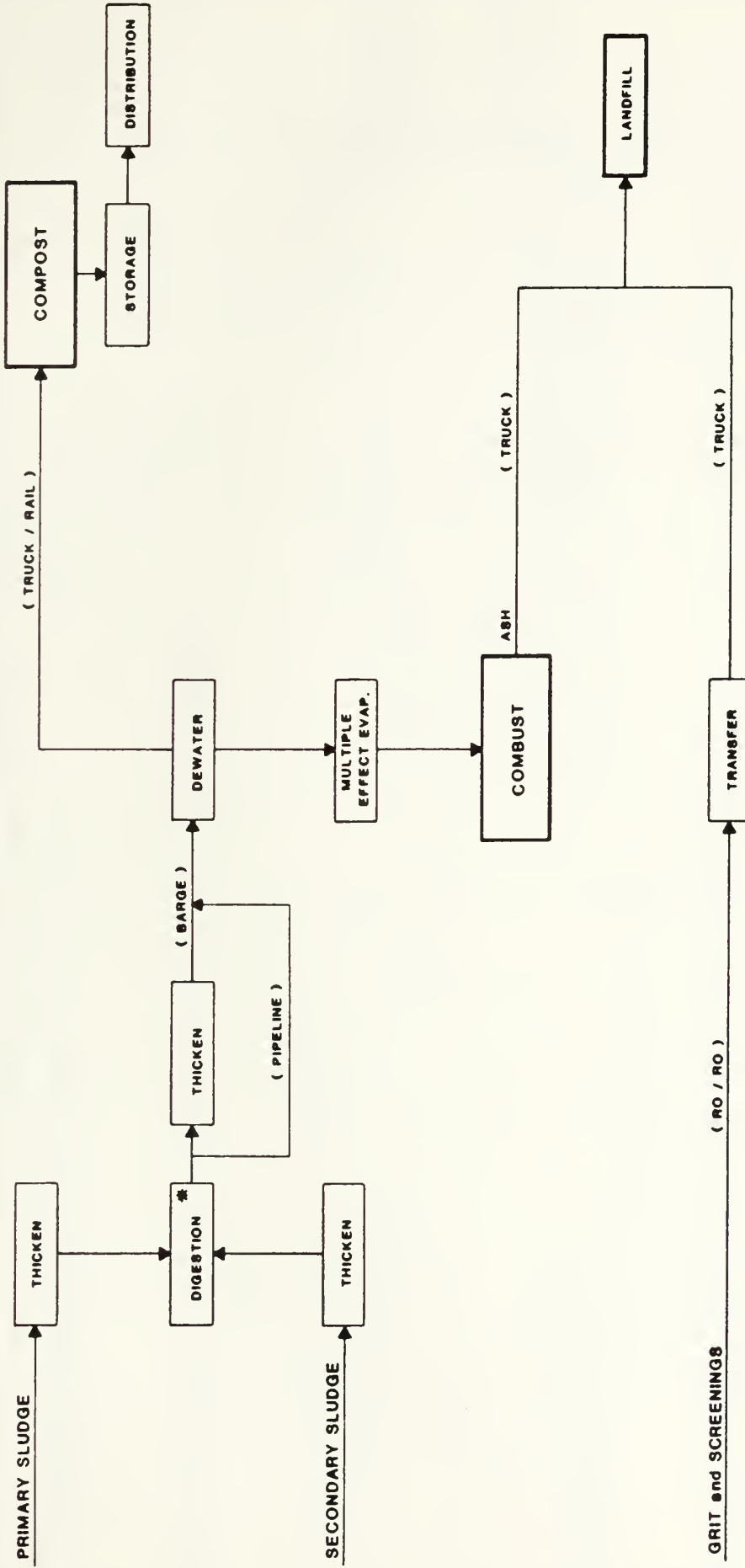
J. AREA REQUIREMENTS FOR SYSTEM ALTERNATIVE COMPONENTS

At this point in the process of identifying candidate options, a conservative approach must be taken in estimating the minimum land area that will be needed to accommodate the various components of the system alternatives since many factors which have a potential bearing on the acreage requirements have not yet been decided. Among these factors are:

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.



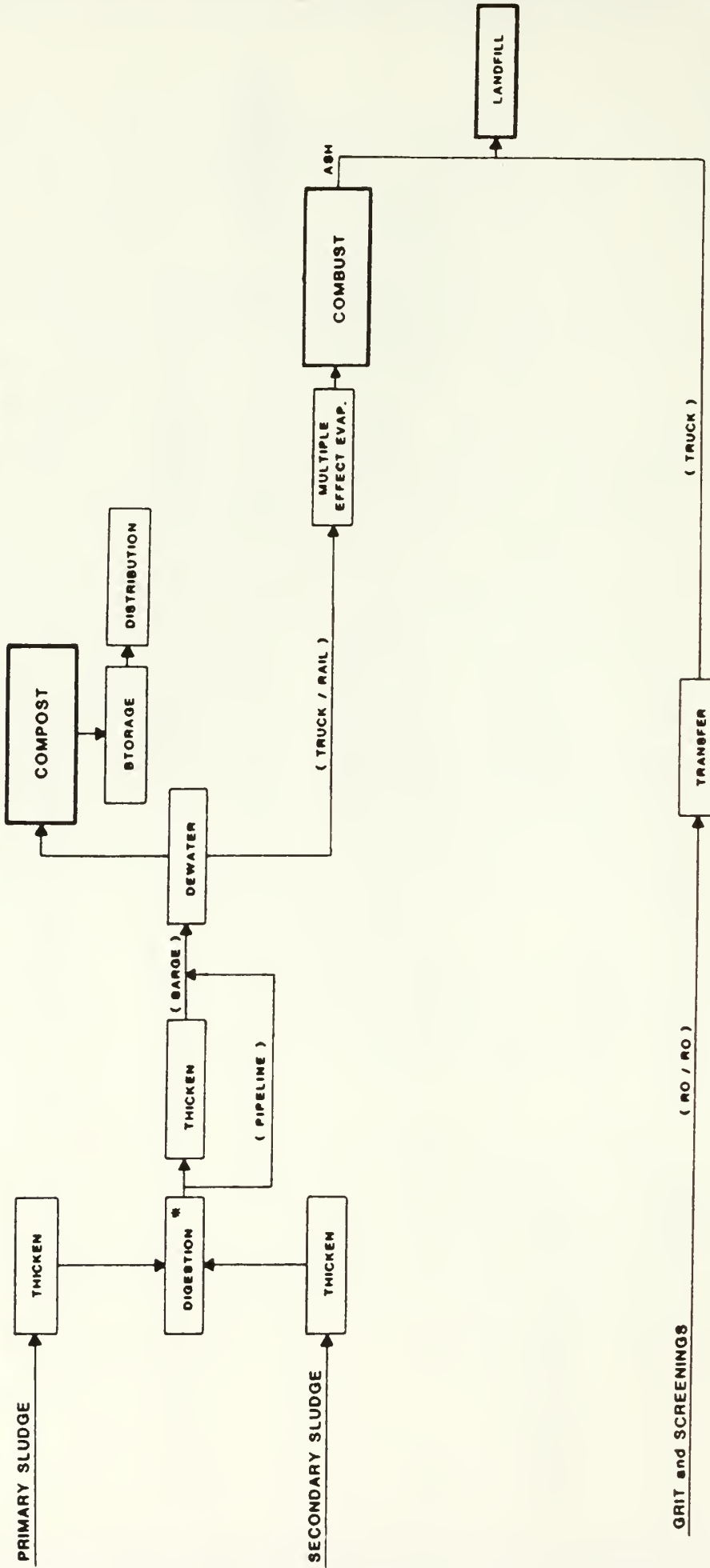
SYSTEM ALTERNATIVE L8

Figure
1-13

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.

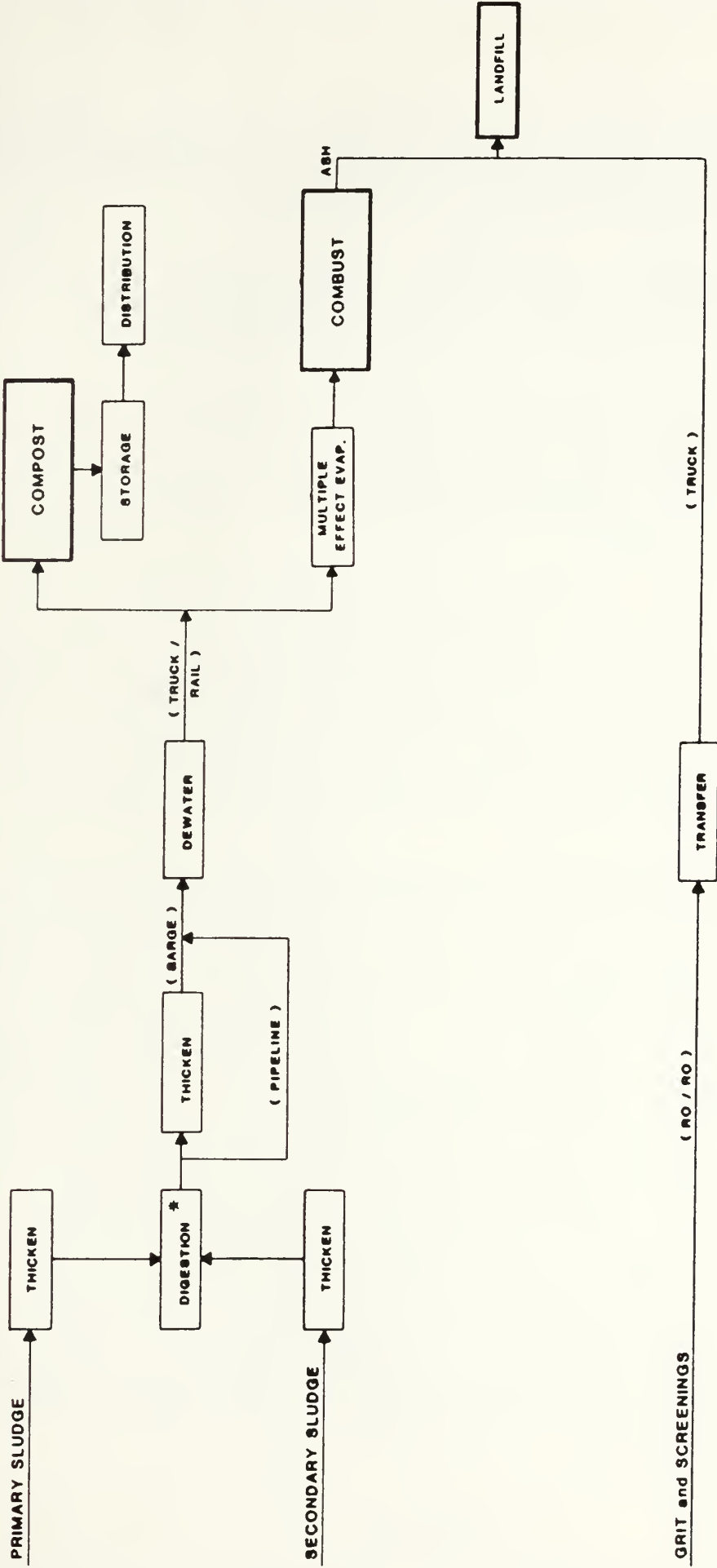


SYSTEM ALTERNATIVE N8

DEER ISLAND

COASTAL SITE

INLAND SITES



* Anaerobic digestion includes methane gas recovery and utilization.

RO / RO - Transport of roll-on, roll-off containers by means of water supply boats.



SYSTEM ALTERNATIVE P8

Figure
1-15

- o Specific quantity of residuals to be handled, processed, and/or disposed; excess capacity to be provided, if any; and number of processing units required to satisfy DEQE redundancy requirements and assure reliable operation.
- o Site location - at the treatment plant, where support facilities may be available, or at another site where administration, laboratory, and personnel facilities may have to be provided, along with space for employee parking.
- o Type and hours of operation for the transportation system(s) to be used in conveying materials to and from the site. For example, a truck on rail system will likely have a larger land area requirement than one employing truck only. Contract hauling may require less land area than an MWRA-operated fleet if the contract hauler were to supply fleet maintenance at another location.
- o Site shape, topography, and other characteristics.

To date, estimates of area requirements have been provided for certain "blocks" of activities in the reports on Technology Assessment and Assessment of Transportation Alternatives. The selection of sites for satisfying the various needs of the system alternatives now requires acreage projections required to accommodate certain combinations of activities.

A list of the potential activities to be supported by each site are summarized in Table 1-3. Not all of these activities are essential to each system. Due to the site specific nature of many of these activities, a minimum net area requirement has been estimated for the various components of the system alternatives. These net area requirements may not encompass all the potential activities associated with the categories of sites identified in Table 1-3. For example; at a landfill site, land areas not suitable for landfilling may be well suited for equipment storage and maintenance areas; employee parking at a compost facility could be accommodated off-site if on-site area limitations were realized. The net area requirements represent an estimate of the minimum area required to satisfy a component of the system alternatives. Buffer areas and potential ancillary facilities are not included. These minimum requirements represent a starting point for the identification of sites most appropriate for a specific

technology component of a system alternative. It is intended that these projections will require further evaluation to account for the many variables that still exist at this stage of the facilities planning process.

The estimates presented in Table 1-3 are minimum net area requirements for the various components of system alternatives.

TABLE 1-3

LAND AREA REQUIREMENTS FOR VARIOUS COMPONENTS OF SYSTEM ALTERNATIVES

- o Coastal Transfer. The net area required for coastal transfer assumes 100 percent of the primary sludge, secondary sludge, and minor residuals production will be transferred through this site. Residuals preprocessing such as sludge dewatering may also take place at this site. 5 acres
- o Combustion Only. The net area required for a combustion facility with or without sludge dewatering assumes the combustion of either predominantly raw secondary sludge, or a portion of the digested combined sludge. Scum may also be handled at this facility. 8 acres
- o Composting Only. The net area required for a composting facility with or without sludge dewatering assumes the composting of either raw primary or a portion of the digested combined sludge. Scum may also be handled at this site. 25 acres
- o Composting and Combustion. The net area requirements for both composting and combustion at the same site reflect some shared facilities as well as separate process facilities for the composting of raw primary sludge and the combustion of predominantly raw secondary sludge, or the composting and combustion of digested combined sludge. Sludge dewatering may also take place at this site. 30 acres

- o Landfill. The net area requirements for a landfill site assume net land area required for the landfill of sludge ash, grit and screenings, and dewatered sludge on an emergency basis only, on a site with flat terrain. The space requirement for landfill sites is more appropriately a volume rather than an area. Therefore, actual area requirements may vary significantly from site to site. 100 acres

CHAPTER 2
PROCESS FOR IDENTIFYING SITES
TO BE MATCHED WITH SYSTEM ALTERNATIVES

A. SITE IDENTIFICATION OVERVIEW

The Site Screening Analysis was performed in a phased manner. The initial (Tier 1) site screening phase consisted of identifying the total universe of potential sites and evaluating their capabilities to support a residuals program activity independent of any consideration of specific technologies or use. In total, 299 sites comprising the universe of potential locations were scored and given a preliminary ordering from most potentially suitable to least potentially suitable. The initial site ordering was refined in a technology-specific (Tier 2) screening. The technology-specific ordering incorporated consideration of technology-specific factors to produce separate ordered lists for each of the residuals program siting needs of the systems alternatives identified Chapter 1. A comprehensive discussion of the initial (Tier 1) and technology-specific (Tier 2) site screening methodology is presented in the report **Site Screening Analysis, Volume I: Methodology** (ERT, 1987). The initial site ordering and the technology-specific ordered lists are described in the report **Site Screening Analysis, Volume II: Results** (ERT, 1987).

The technology-specific ordered listings from the Tier 2 screening analysis were used to fulfill the siting needs of the systems alternatives identified in Chapter 1. From the technology-specific site orderings, a total of twelve (12) sites were recommended by the RMFP technical team to the MWRA Board of Directors for further study in the Candidate Options Evaluation. This chapter describes the twelve (12) recommended locations and the process used for their selection. The site selection process entailed drawing from the technology-specific ordered lists of sites, those locations which, in the judgement of the RMFP technical team, best fulfilled the size, locational, and engineering requirements of the system alternatives for residuals handling, processing, transportation and disposal.

Figure 2-1 summarizes the entire RMFP siting process, while Figure 2-2 illustrates the steps that were followed in identifying recommended sites from the lists. The ensuing sections of Chapter 2 detail the key steps performed in identifying the candidate sites.

Two major concepts pertaining to residuals management help to guide the application of the site evaluation process illustrated in Figure 2-2. The first was the need to carry forth into the environmental assessment and public review process a reasonable number of system alternatives. As detailed in Chapter 1, a systematic approach was used to develop and screen the full range of possible system combinations. To fulfill the requirements of the system alternatives, three general site types (island, coastal and inland) and three technologies (composting, combustion with energy recovery, and land-filling) need to be incorporated into the candidate options.

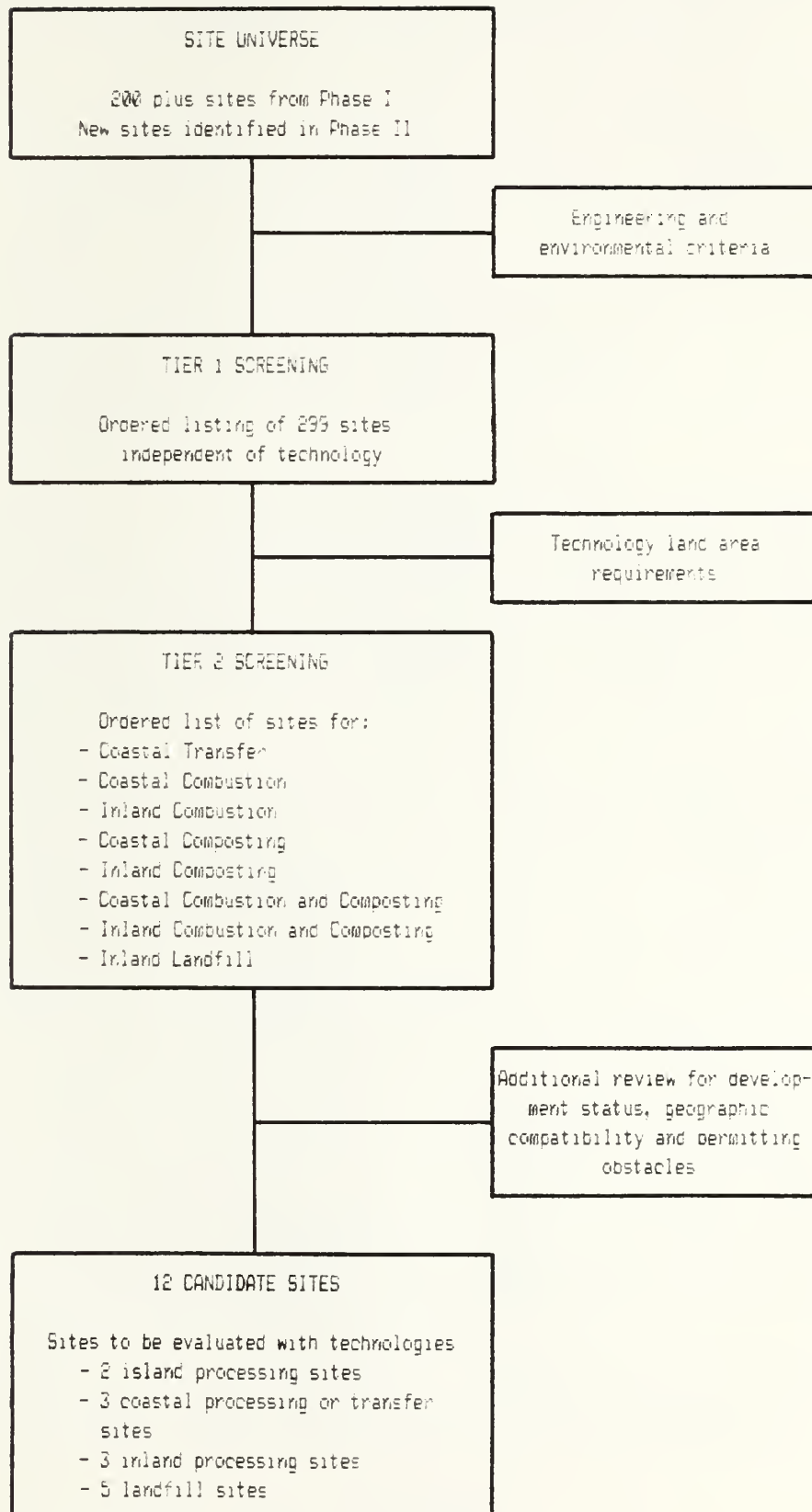
The second concept is the recognition that more than one site will be needed to satisfy the residuals program needs for coastal transfer, processing and disposal. Because of this need, the sites within a candidate option should have some reasonable compatibility with one another, especially in terms of geographic location and regional transportation system access.

B. TECHNOLOGY SPECIFIC SITE LISTS

The Tier 1 site screening analysis produced an ordered ranking of the 299 sites comprising the universe of potential RMFP locations. This initial screening was performed independent of any consideration of specific residuals program use or technology. The results of the initial technology-independent site ranking are presented in the report **Site Screening Analysis, Volume II: Results**.

Upon completion of the technology-independent (Tier 1) screening analysis, the technical team initiated preparation of technology-specific (Tier 2) site listing. The purpose of the technology-specific listings is to identify from the total site universe those

Figure 2-1
RMFP Siting Process



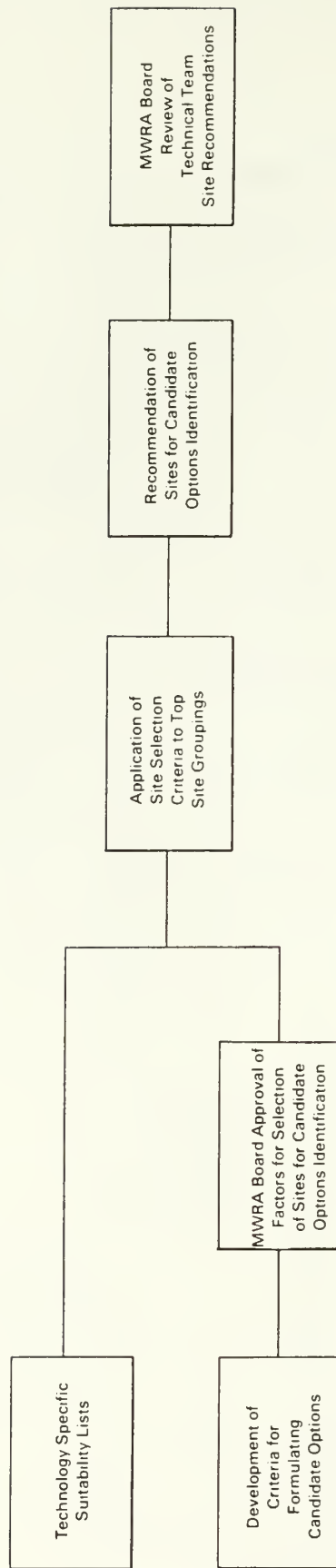


Figure 2-2 Candidate Option Site Selection Process

locations that are most suitable for supporting specific RMFP program components. Specific listings were prepared for the following site uses identified in Chapter 1:

- o Coastal Transfer Sites
- o Coastal Combustion Only Sites
- o Inland Combustion Only Sites
- o Coastal Composting Only Sites
- o Inland Composting Only Sites
- o Coastal Combustion and Composting Sites
- o Inland Combustion and Composting Sites
- o Inland Landfill Sites

Figure 2-3 illustrates the process used to prepare the technology-specific site ordered listings. A detailed description of this process is presented in Chapter 5 of the report **Site Screening Analysis, Volume 1: Methodology** (ERT, 1987). A summary of the major steps used in the Tier 2 site screening analysis follows:

1. Calculate net usable area for entire site bank by identifying undevelopable portions of each site (e.g., developed area, surface water bodies, significant wetland areas, or severe slopes).
2. Determine, from Chapter 1, minimum land area requirements for the potential RMFP component uses (e.g., coastal transfer site, inland composting site, etc. See Table 2-1)
3. Compare calculated usable area for each site with minimum land area requirements for the RMFP component uses.
4. Develop lists of sites which satisfy the minimum acreage requirements and geographic location for each of the RMFP components (e.g., the inland combustion and composting site list consists of all inland locations with net area >30 acres.
5. Develop technology-specific suitability criteria for each possible RMFP component. These are in the form of

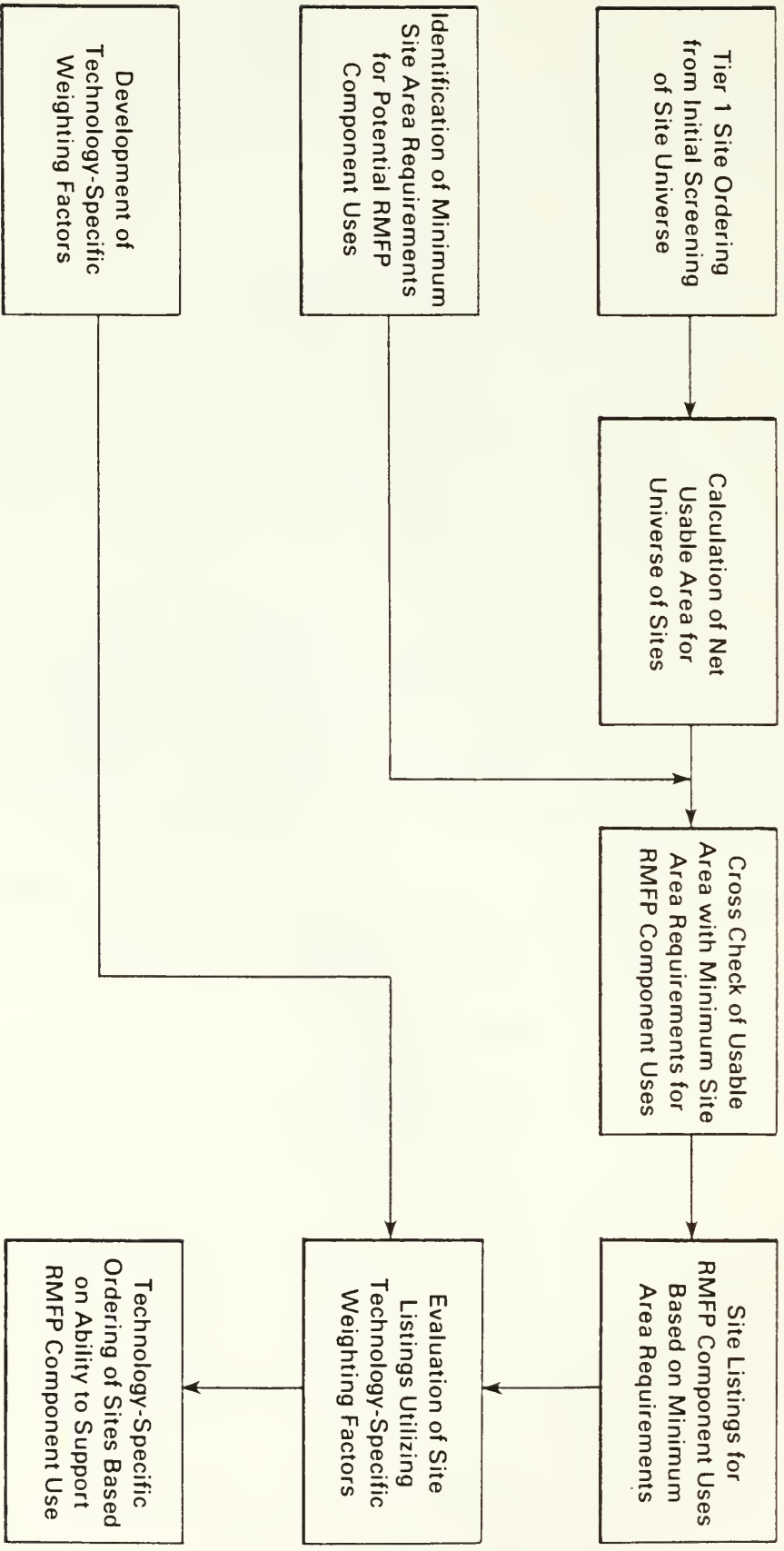


Figure 2-3 Technology Specific Site Ordering Process Diagram

TABLE 2-1

TECHNOLOGY-SPECIFIC SITE ACTIVITIES
MINIMUM LAND AREA REQUIREMENT GUIDELINES

<u>Site Location</u>	<u>Potential RMFP Program Application</u>	<u>Minimum Land Area Requirement (Acres)</u>
Coastal/Island	Transfer	5
	Composting	25
	Combustion	8
	Combustion & Composting	30
Inland	Combustion	8
	Composting	25
	Combustion & Composting	30
	Landfill	100*

*The space requirement for landfill sites is more appropriately a volume rather than an area. This volume is equivalent to an area of approximately 100 acres for sites with flat terrain. This acreage was reduced for sites with existing topography (such as a quarry) that would permit development of a greater than normal vertical height profile.

technology-specific weighting factors, which amplify the importance of certain Tier 1 suitability criteria and deemphasize others.

6. Apply technology-specific weighting factors to the suitability scores and weighting factors (technology-independent) developed in Tier 1 to derive, for each site, a separate technology-specific suitability score for each RMFP component use.
7. Develop separate technology-specific site ordered lists for each of the RMFP component uses.

The resulting technology-specific ordered site lists are presented in Appendix A, and in the report **Site Screening Analysis, Volume II: Results** (ERT, 1987). The land area requirements used in preparing the technology-specific ordered listings are presented in Table 2-1. These minimum land area requirements reflect consideration of both facility engineering and operational space needs. Recognizing that the land area available for use could be affected by on-site environmental conditions and refinement in site boundaries based on additional information on parcel ownership, the estimates of area requirements were developed using conservative assumptions. The conservative area guidelines also provide the latitude required for development of measures to mitigate potential environmental impacts, such as provision of buffer zones, landscaping, and noise barriers.

C. CRITERIA FOR SELECTING CANDIDATE SITES

A set of site selection factors were developed to assist in the selection from the technology-specific ordered lists, a group of sites to be merged with the system alternatives identified in Chapter 1 to form candidate options. These additional criteria were needed to help interpret the site screening results and take into consideration factors such as conflicting development plans, geographical compatibility with other candidate locations, and residuals system interrela-

tionships. These criteria were also developed to keep the number of alternatives carried forward for further evaluation to a manageable number.

The sites recommended for further evaluation as a location for one or more components of the residuals management program were selected based on the application of the following criteria to the technology-specific lists:

- o Ranking: the applicable technology-specific numerical ranking from the Tier 2 site screening analysis.
- o Site Use Flexibility: including site size and the apparent adaptability that the site provides for current program uses and potential changes in future program needs.
- o Development Status: the current and likely near-term availability of the site in term of known competing plans for site use.
- o System Compatibility: with respect to geographic locations of other sites within each system alternative.
- o Site Transportation Access: the ease or difficulty with which the transportation needs of the system alternatives could be met.
- o Permitting Feasibility: the presence of any major or insurmountable permitting obstacles(s) based on the intended site use.
- o Variety of Site Types: to provide decision-makers with a range of geographic options for future residuals management.

A more detailed description of each of the site selection criteria follows.

1. **RANKING.** Although sites were not selected based on the screening analysis rankings alone, the technology-specific rankings provide an objective, comparable measure of the relative environmental and technical suitability of sites. As such, the technology-specific rankings were an important criterion in the selection of sites for formulating candidate options. In addition to the overall technology

rankings, site scores on individual criteria and specific site evaluation features (e.g., surface water body proximity, presence of threatened or endangered species, etc.), helped focus attention on potential permitting obstacles. To fulfill the flexibility criterion discussed below, sites were sought that consistently scored high for a number of different technologies (in several technology-specific ordered lists).

2. **SITE USE FLEXIBILITY.** Site flexibility was determined for each site in terms of the number of different RMFP component uses it could fulfill. This criterion was used to ensure that selected sites had the ability to adapt to potential future changes in the residuals management plan. To limit the number of sites carried forward for future evaluation, it was felt highly desirable to select locations that : (1) could fulfill multiple RMFP component uses as the program is currently defined; (2) could accommodate potential future changes in technology-driven site needs; and (3) possessed adequate acreage to accommodate future space demands should they expand.

Site rankings for each of the eight RMFP component uses were reviewed. Sites scoring consistently high for all potential site uses and with adequate acreage to fulfill the most land intensive uses were more desirable than sites that may have ranked higher for a single use but scored poorly for, or were too small to meet, other program uses.

To ensure adequate buffering between proposed site uses and surrounding communities or sensitive receptors, larger sites were preferred over similarly ranked smaller sites. As discussed later, the application of this criterion resulted in selection of candidate sites to fulfill coastal and inland processing requirements primarily from the dual-technology (composting and combustion) lists.

3. **DEVELOPMENT STATUS.** Results of discussions with local assessors' offices and with a commercial real estate firm were conducted to assess the current and near term future availability of sites. Sites with active, viable, high-intensity uses or sites upon which construction had already commenced were moved to the bottom of the ranked lists, effectively eliminating them from consideration. Exceptions to the above were developed locations, or sites under

development which would, after development, still have adequate acreage to be viable for one or more potential RMFP component uses. For example, if active development was occurring on a 75-acre site, but the active development would consume only 40 acres, the site was not moved to the bottom of the ranked lists since after development, 35 acres would still be available for use.

Proposed development plans, at various stages in the approval process, were found to exist at virtually all of the higher ranking sites in the site bank. Sites which only preliminary plan approval, or whose permitting process had stalled were actively considered. Sites with most final approvals in place and upon which development was imminent or had begun were passed over in favor of other sites that met all site selection criteria.

4. **SYSTEM COMPATIBILITY.** Highly-ranked sites meeting the above criteria were examined from a geographic perspective, relative to other sites needed to fulfill each system alternative. For example, highly suitable inland processing locations existed both at the northern, and southern extremes of the MWRA service area. Therefore, it was desirable to carry forward coastal locations that would geographically link-up to these locations, resulting in part, in the selection of north shore and south shore coastal transfer points.

5. **SITE TRANSPORTATION ACCESS.** In the Site Screening Analysis, sites were scored relative to physical transportation features pertaining to each location considered in isolation (availability of rail access, type of roadway access, etc.). In site selection, this criterion was approached from more of a systems perspective. Sites were assessed in terms of the ease or difficulty with which the likely transportation needs of the systems alternatives could be met. Existing transportation corridors were examined for ease of site accessibility and what transportation system improvements would be required. Sites with regional accessibility from rail or major arterial roadways were preferred over sites which would entail considerable roadway system improvements on a regional scale.

6. **PERMITTING FEASIBILITY.** Sites were reviewed with respect to the presence of any major or insurmountable permitting obstacles that

would reduce the probability of successful program implementation. Examples of such obstacles would include immediate proximity of an acute health care facility near a proposed combustion site, direct hydrologic connection to a surface water reservoir within 1 km (in the case of a landfill), presence of substantial unique critical habitat of one or more resident endangered species; or presence of high yield or sole source aquifer used for a municipal water supply with water supply wells located within 1 km.

7. **VARIETY OF SITE TYPES.** To provide decision makers with a range of options, it was desirable, when the preceding criteria were adequately satisfied, to include a variety of site types in the final site recommendations. This included providing site choices with a wide geographic distribution (northern, southern, eastern and western). To fulfill the systems requirements sites were selected representing island options as well as coastal and inland locations. Sites located in urban areas were included as well as rural sites, and abandoned industrial locations were included as well as "greenfield" locations. Sites with industrial zoning were included along with locations zoned commercial, residential and rural. This variety will provide a full range of options to be further analyzed from environmental, economic, engineering and policy perspectives.

D. APPLICATION OF SITE SELECTION CRITERIA.

Using the site selection criteria discussed above, a total of 12 recommended candidate sites were selected from the Site Screening Analysis. This section discusses how the site selection criteria were applied to identify the sites, which fell into the following categories:

- o Island Processing Sites (2)*

*Island sites were considered and scored with coastal sites in the Site Screening Analysis. See text for details surrounding the selection of these sites.

- o Coastal Processing and/or Transfer Sites (2)
- o Inland Processing Sites (3)
- o Inland Landfill Sites (5)

Tables 2-2 through 2-4 summarize the comparative ability to the top group of sites from the technology-specific ordered lists to support the various residuals management program activities. For both coastal and inland processing locations, a number of the top-ranked sites for RMFP component uses with the lowest acreage requirements (e.g., coastal transfer, combustion only) were of insufficient size to be considered for dual-technology options. Since the sites that were large enough to accommodate dual technologies provided more flexibility in terms of the number of RMFP component uses they could fulfill, attention was focused on the inland and coastal ranking lists for the dual technology composting and combustion uses.

Using the site rankings on these lists as the primary guide, the technical team worked down the lists, examining each in terms of the site selection criteria. Site rankings for the individuals RMFP component functions (shown on Tables 2-2 through 2-4) were cross referenced throughout this process. Fact sheets were prepared for the top-ranked coastal, inland processing and landfill lists reflecting how each site matched up against the site selection criteria. These are provided in Appendix B. Sites with the highest ranking that met all of the site selection factors were recommended for inclusion in candidate options.

In the process of selecting sites from the technology-specific site lists, there were several instances where merging two nearby or contiguous sites to form a single site resulted in a candidate location that more fully satisfied the site selection criteria than either of its component parts. The first example involves two sites in Wilmington, WIL-08 and WIL-09. These sites ranked first and second on the inland dual technology list. The northern portion of WIL-09 is under active commercial/light industrial development and the southern portion of WIL-08 was recently developed. Development proposals have been made for the area between these two parcels, but lack of wastewater system hookups from a neighboring town have reportedly stalled the development. The southern portion of WIL-09, the northern portion

of WIL-08 and the intervening area were merged to form a single site candidate, which was then evaluated against the site selection criteria.

Two sites in Ashland (ASH-22 and ASH-18) were similarly merged. ASH-22 ranked first on the landfill list. ASH-18 ranked 13th, but its proximity to rail lines and an area of industrial activity were felt to enhance ASH-22's site access. Thus, these sites were merged to create a single site candidate.

Merger of WLP-15 (17th in the landfill list), in Walpole, with the higher ranking (3rd) WLP-13 provides an expansive site (approximately 675 acres) with more potential for effective buffering than afforded by WLP-13 alone. Thus, these sites were merged to form a single site candidate.

As a cross-check, the merged site pairs were each scored as a single site to determine where they would have ranked had they been initially identified as a single site. The WIL-08/09 site would have ranked first on the inland composting and combustion list. The merged ASH 22/18 site would have ranked fourth on the landfill list, while the merged WLP 13/15 would have ranked seventh for landfills. So that the entire records of this project can be kept clear and re-traceable, the initial designations of these now merged sites have been maintained as the original, single site designations in the site lists and data files.

Spectacle Island (BOS-25) and Deer Island (BOS-26) ranked well against other coastal sites in the categories: coastal composting only and coastal composting and combustion, (Table 2-2). The relative high ranking of the island sites contributed to their being recommended for further evaluation. Because of the proximity of the Deer Island site to the planned wastewater treatment facilities, this site has significant logistical advantages with respect to residuals handling and transportation, which contributed to its selection. BOS-25, Spectacle Island is only 1.5 nautical miles from Deer Island, the collection point of the wastewater residuals. This proximity,

TABLE 2-2

COASTAL PROCESSING SITE ORDERING

Site ID	Town Location	Name	Dual Technology Ranking: Composting and Combustion	Comparative Site Ranking		
				Coastal Transfer	Combustion Only	Composting Only
QUI-07 ¹	Quincy	General Dynamics Shipyard	1	6	6	1
BOS-23	Boston	Neponset River Park	2	13	11	2
BOS-25 ¹	Boston	Spectacle Island	3	17	12	4
LYN-02 ¹	Lynn	Lynn Harbor	4	15	13	3
BOS-26 ¹	Boston	Deer Island	5	25	18	5
SOM-02	Somerville	Mystic River Reservation	6	23	20	6
QUI-09	Quincy	Moon Island	7	26	21	7
HULL-01	Hull	Peddock's Island	8	28	23	8
BOS-28	Boston	Thompson Island	9	30	24	10
BOS-27	Boston	Lovell Island	10	29	25	9

¹ Sites recommended by technical team for Candidate Options Consideration

coupled with the site's lack of an active land use and its separation from adjacent coastal development, led to the selection of Spectacle Island as a candidate site.

Coastal sites consist of Lynn, South Harbor, (LYN-02) and Quincy, General Dynamics Shipyard (QUI-07). Quincy Shipyard ranked number 1 in categories: coastal composting only and coastal combustion and composting. The previous heavy industrial activity on the site has resulted in an infrastructure that would facilitate reuse for residuals program activity. The site has good barge access to Deer Island, (9 nautical miles away) and on-site rail spurs provide the option of land-based transportation by rail. This site provides sufficient flexibility to accommodate any or all of the program needs for a coastal site.

Lynn, (LYN-02), is a large coastal site in the City of Lynn. Similar to QUI-07, LYN-02 ranked well in all four coastal categories: transfer, combustion only, composting only and combustion and composting. Again, the high ranking in several categories indicates the flexibility of the site to meet program needs. Marine transportation between Deer Island and LYN-02 is facilitated by its location and significant water frontage. Proximity of the Lynn Water and Sewer Commission's wastewater treatment plant and residuals disposal site may afford some opportunity to consolidate residuals management needs.

Despite its high ranking, BOS-23 was not selected. This site is the former Neponset Drive-in, and is under active construction as a new MDC waterfront park. Because the development plans for this site have proceeded to the point of active construction, and the permitting obstacles associated with taking the site out of the park use, this site was passed over in favor of other locations. Similarly, SOM-02, the Mystic Reservation, was not selected. In addition to the same permitting obstacles that would be encountered to remove this site from park use, it ranked lower than those sites selected.

Inland processing sites were also scored and ranked using the categories: combustion only, composting only, or dual technology

combustion and composting. Table 2-3 shows the high ranking of the contiguous sites WIL-08 and WIL-09 in three categories, combustion, composting or both combustion and composting. The high ranking, first in each category, provides a site with flexibility that can accommodate any residuals program component. As a merged site WIL-08/09 would rank between WIL-08 and WIL-09 which rank first and second, respectively, for dual technology composting and combustion. The site is located in a developing light industrial and commercial office land use setting. Highway access to the site provided by I-93/Route 125/Ballardvale Road is very good. These factors combined with the high ranking of the sites both separately and merged together led to the selection of WIL-08/09.

Stoughton crushed stone (STO-06) ranked third for inland composting and combustion (second when WIL-08 and WIL-09 are merged. Abutting land users are primarily industrial and include an asphaltting operation. Highway access to the site is from either of two interchanges on Route 24 and is considered very good. These factors contributed to the selection of the STO-06 as a processing location.

Walpole (WLP-07), ranks relatively high in the composting only (5th) and dual technology combustion and composting category (3rd after WIL-08/09 and STO-06). A portion of the site containing a vacant office building is for sale. The heavily forested nature of the site offers significant buffering potential to screen residuals facilities from the nearest residences. Although highway access would require use of Washington Street, an arterial facility with abutting residential development, the site has rail access potential.

A number of sites ranked well in the inland landfill category summarized in Table 2-4. Ashland (ASH-22), ranked first in the landfill category (See Table 2-4). Other selected sites ranking high in the landfill category are: Walpole (WLP-13), Bedford (BED-09), Malden (MAL-01) and Walpole (WLP-08), (See Table 2-4).

ASH-22, which ranked 1st, was merged with nearby ASH-18, which ranked 13th to improve the transportation access. ASH-18 brings to the site rail access potential and roadway transportation access through a industrial area. Another Ashland site, Ash-20, Wildcat

TABLE 2-3

INLAND PROCESSING SITE ORDERING

Site ID	Town Location	Name	Dual Technology Ranking: Composting and Combustion	Comparative Site Ranking	
				Combustion Only	Composting Only
WIL-08 ¹	Wilmington	Wilmington Industrial Park	1	1	1
WIL-09 ¹	Wilmington	Wilmington Industrial Park	2	5	2
STO-06 ¹	Stoughton	Stoughton Crushed Stone	3	11	4
WLP-07 ¹	Walpole	Bird Property	4	12	5
ASH-22	Ashland	Magunco Hill	5	13	8
WES-02	Westwood	Junction Rt. 109/129	6	15	7
BUR-03	Burlington	Junction Rt. 3/128	7	14	6
WLP-14	Walpole	Cedar Swamp	8	16	13
WLP-11	Walpole	North Walpole	9	18	10
HLB-11	Holbrook	Sycamore Street	10	19	14

¹Sites recommended by technical team for Candidate Options Consideration

TABLE 2-4

INLAND LANDFILL SITE ORDERING

<u>Site ID</u>	<u>Town Location</u>	<u>Name</u>	<u>Landfill Ranking</u>
ASH-22 ¹	Ashland	Magunco Hill	1
ASH-20	Ashland	Town Conservation Land	2
WLP-13 ¹	Walpole	North Walpole	3
BUR-03	Burlington	Junction Rt. 3/128	4
WES-02	Westwood	Junction Rt. 109/128	5
HLB-13	Holbrook	Holbrook Rifle Range	6
WLP-08 ¹	Walpole	MCI Walpole	7
MAL-01 ¹	Malden	Rowe Quarry	8
BED-09 ¹	Bedford	Spring Street	9
WOB-10	Woburn	Whispering Hill	10
STO-08	Stoughton	Stoughton Rifle Range	11
NED-02	Needham	West of North Hill	12
ASH-18 ¹	Ashland	Nyanza Site	13
WLP-12	Walpole	Gould Street	14
NAT-07	Natick	Glen Street	15
CAN-12	Canton	Ponkapog Golf Course	16
WLP-15 ¹	Walpole	North Walpole	17

¹Sites recommended by technical team for Candidate Options
Consideration

Hill, was not selected. This site is currently a park and its terrain is severe and not conducive to landfilling. As a result, this site was passed over in favor of more suitable locations. WLP-13, in Walpole, ranked third for landfilling and was merged with contiguous WLP-15, which ranked 17th. The expansive site resulting (675 acres) should provide adequate area to handle all RMFP landfilling needs while maintaining an extensive amount of buffering area. Site access is provided by route 109, a two-lane arterial. A site in Burlington (BUR-03), which was not selected, was recently taken by the Town by eminent domain for protection of the nearby well fields. The site is also virtually landlocked. Major transportation systems improvements would be needed to access the site. This has proven to be an obstacle to previous development attempts. These factors led to passing over this site in favor of more suitable locations. A large site in Westwood (WES-02) was ranked fifth on the landfill list. The site is slated for development of a nursing home. The required approvals are in place, and construction is imminent. Therefore, this site was passed over in favor of other locations. HLB-13, located in Holbrook is surrounded by wetlands and has a direct hydrologic connection to a proximate active surface water reservoir. The permitting obstacles associated with this configuration caused this site to be passed over in favor of more suitable locations.

WLP-08, located next to MCI- Cedar Junction, is characterized by well drained soils with bedrock averaging ten feet or greater below the ground surface. The forested nature of the site provided significant buffering potential for the nearest residences. Access to the site as provided by Route 1A, a two lane arterial roadway and there are active rail lines 200 yards east of the site.

MAL-01, the Rowe Quarry, straddles the Malden/Revere line. The environmental characteristics of this dry quarry make the site suitable for a landfill. Significant potential capacity exists due to the depth of the on-going quarry operation. Access to the site is provided by Route 1. These factors contributed to the selection of MAL-01 as a landfill candidate.

BED-09 is located next to Route 3 in Bedford. The site is characterized by well drained soils with bedrock averaging ten feet or greater below the ground surface. The site is completely forested providing significant buffering potential. Highway access currently requires use of medium-duty town roadways; however, a currently proposed slip ramp on Route 3, if implemented, would significantly enhance highway access.

Appendix B provides fact sheets on how each of the top sites match up against the site selection criteria. Appendix C summarizes the key environmental information data sets for the top ranked technology-specific ordered sites. The information presented summarizes the characteristics that led to the ranking of the specified locations.

E. DESCRIPTION OF RECOMMENDED SITES

The sites recommended for further evaluation as a location for one or more components of the residuals management program as a result of applying the system criteria to the technology-specific site listings are presented in Table 2-5. Figure 2-4 illustrates the location of the recommended sites.

The sites have been recommended to the MWRA Board of Directors based on the site screening, technology and transportation analyses performed to date. The recommendations of the technical team will be reviewed by the Board of Directors. The Board's review will include consideration of regional policy directives and direct interaction with the communities within which the sites are located.

The site types recommended represent a geographic cross-section of the MWRA service area and include Harbor Islands, coastal locations and inland locations. Brief site information sheets and general location maps for each of the recommend sites follows. Appendix C summarizes environmental data for the selected sites as well as other high-ranking sites. The order of presentation is alphabetically by site type.

TABLE 2-5

RECOMMENDED CANDIDATE SITES FOR THE MWRA RESIDUALS MANAGEMENT FACILITIES PLAN

Site ID	Community	Location	Available Acreage*	Potential Use
<u>Island Sites</u>				
	Boston	Deer Island	20-30	Composting or Combustion
	Boston	Spectacle Island	77	Composting and/or Combustion
<u>Coastal Sites</u>				
	Lynn	Lynn Harbor Near Sewage Treatment Plant	48	Transfer, Composting and/or Combustion
	Quincy/Braintree	Quincy Shipyard	150	Transfer, Composting and/or Combustion
<u>Inland Sites</u>				
	Stoughton	Off Rt. 139, 1 Mile South of Canton Line	90	Composting and/or Combustion
	Walpole	Off Washington Street Near Norwood Line	75	Composting and/or Combustion
	Wilmington	Near Wilmington/Andover Line Off Rt. 125	50	Composting and/or Combustion
<u>Landfill Sites</u>				
	Ashland	Northwest of Rt. 135 Near Hopkinton Border	290	Ash, Grit and Screenings Landfill
	Bedford	Southwest of Rt. 3 East of Springs Road	96	Ash, Grit and Screenings Landfill
	Malden/Revere	Quarry East of Rt. 1 North of Salem Street	42	Ash, Grit and Screenings Landfill
	Walpole	Adjacent to MCI Cedar Junction	93	Ash, Grit and Screenings Landfill
	Walpole	South of Rt. 109 at Medfield Line	675	Ash, Grit and Screenings Landfill

*Minimum area requirements:

Transfer	5 acres
Combustion only	8 acres
Composting only	25 acres
Composting and Combustion	30 acres
landfilling (one or more sites)	100 acres

**Sites to be evaluated for any one or all of the potential used noted.

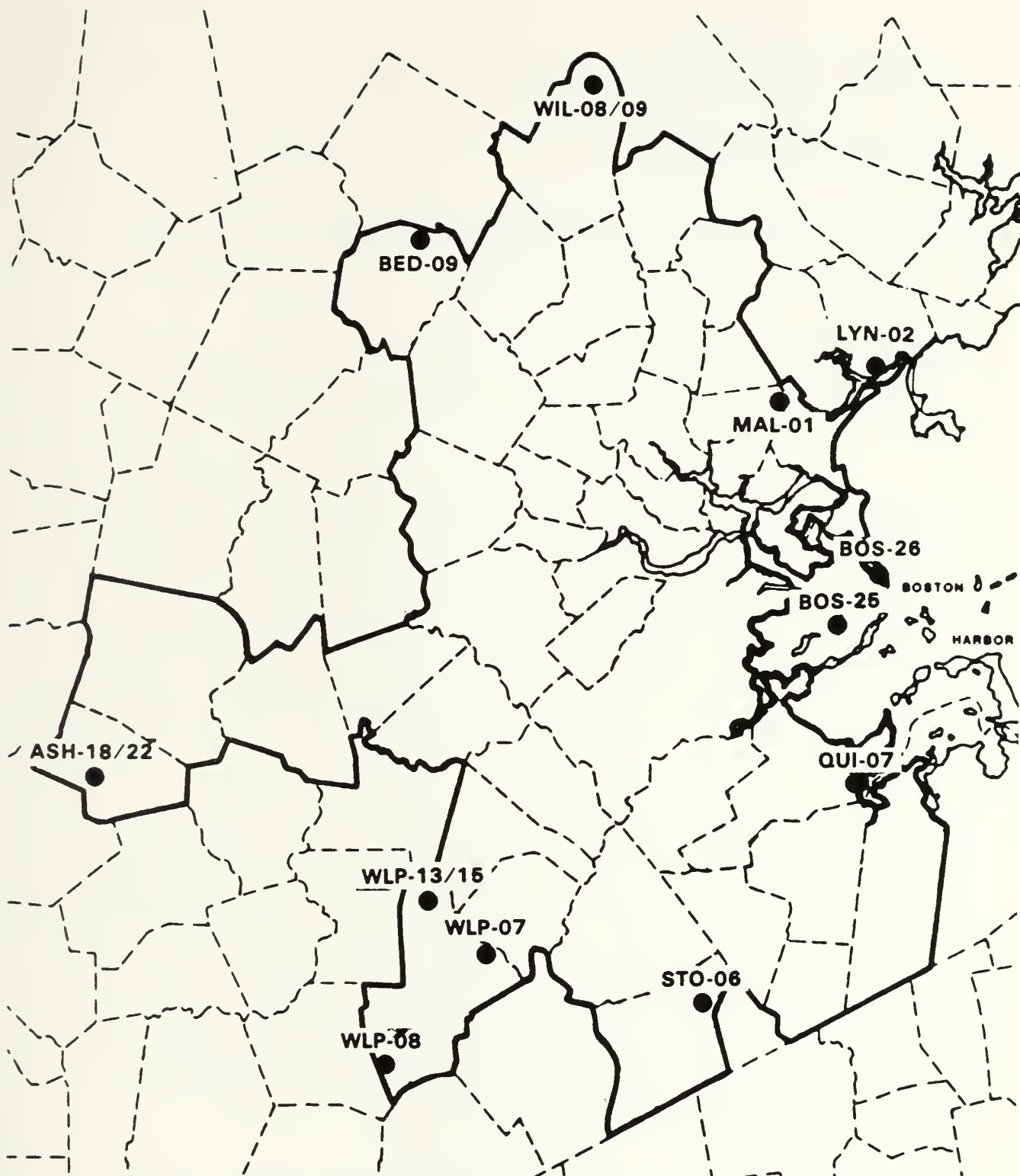


Figure 2-4 Location of Recommended Sites for RMFP

LOCATION: Deer Island, City of Boston

SITE IDENTIFICATION CODE: BOS-26

POTENTIAL RESIDUALS PROGRAM USES: Possible uses include residuals storage, dewatering, transportation handling, composting, or combustion.

TRANSPORTATION ACCESS: Intended access would be by barge. Land-based access would be possible though not recommended through Winthrop via Shirley Street and Tafts Avenue.

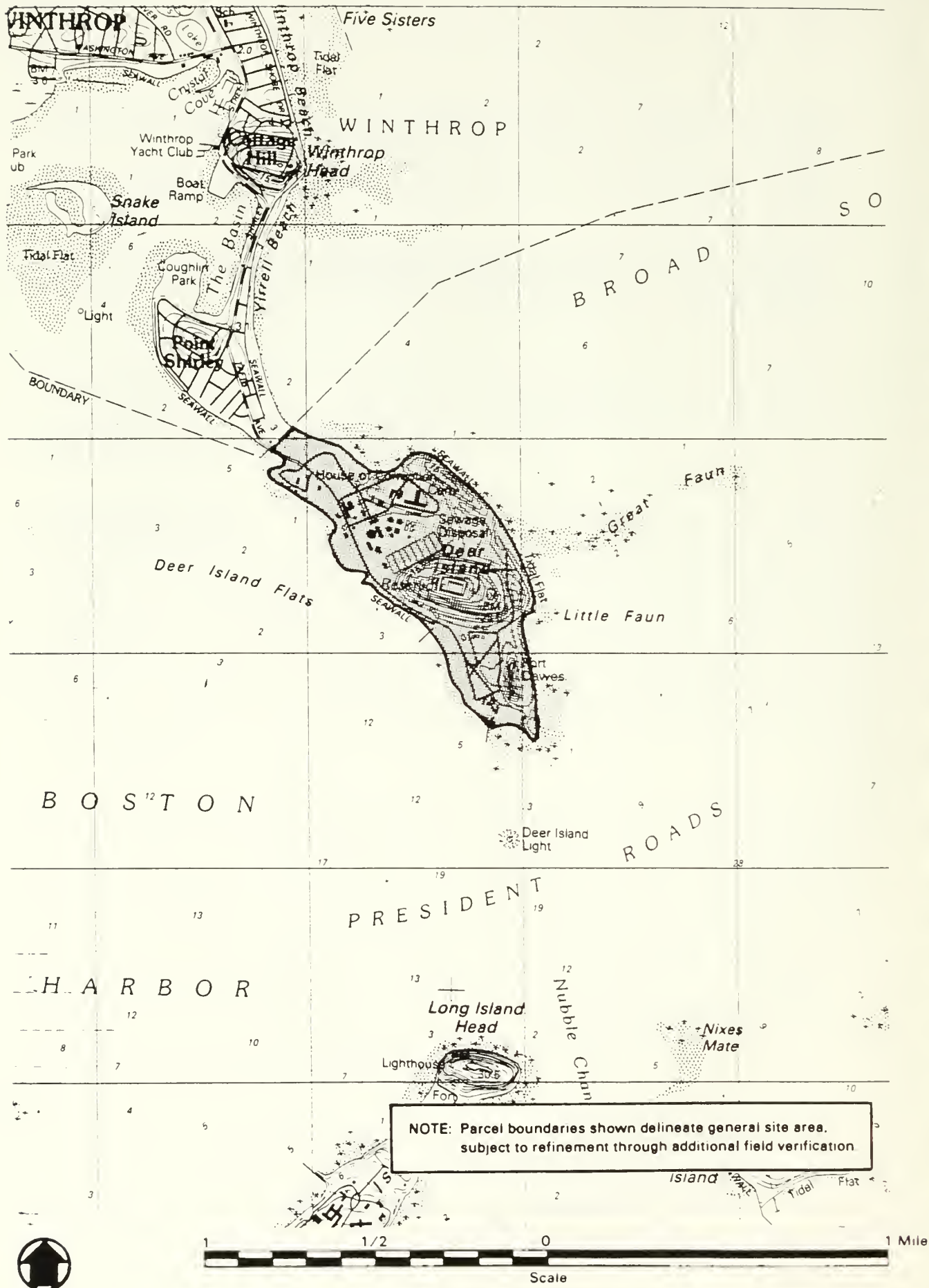
SITE DESCRIPTION: Deer Island is located southeast of the Point Shirley portion of Winthrop. Based on the most current plans for the wastewater treatment plant, approximately 20-30 acres would be available for residuals management use. The island is zoned for commercial - retail business and office use. Current land uses include the existing wastewater treatment plant and the Deer Island House of Correction. The island is approximately one mile east of Logan Airport.

Review of the existing physical environmental characteristics of the land area available indicate the suitability for the potential residual program activities. The geologic, soil and topographic features of the site area can support building construction. No limitations were identified with respect to the presence of major on-site wetland areas, surface water bodies, or ecological resources. Because of the proximity to the planned wastewater treatment plant facilities, the site area has logistical advantages with respect to residuals handling and transportation.

The primary considerations that will require evaluation regarding the use of Deer Island for residuals processing are: (1) proximity to the residential land use development in Point Shirley, (2) cumulative air

quality conditions, (3) potential noise generation, (4) ground access limited to highways which traverse Winthrop, (5) relationship to airport operations, and (6) available acreage limitations from other on-site activities.

OWNERSHIP: Deer Island is owned by the Commonwealth of Massachusetts and the MWRA.



Location of BOS-26

LOCATION: Spectacle Island, City of Boston

SITE IDENTIFICATION CODE: BOS-25

POTENTIAL RESIDUALS PROGRAM USE: Possible uses include dewatering and composting and/or combustion of residuals.

TRANSPORTATION ACCESS: By barge, 1.5 nautical miles southwest of Deer Island.

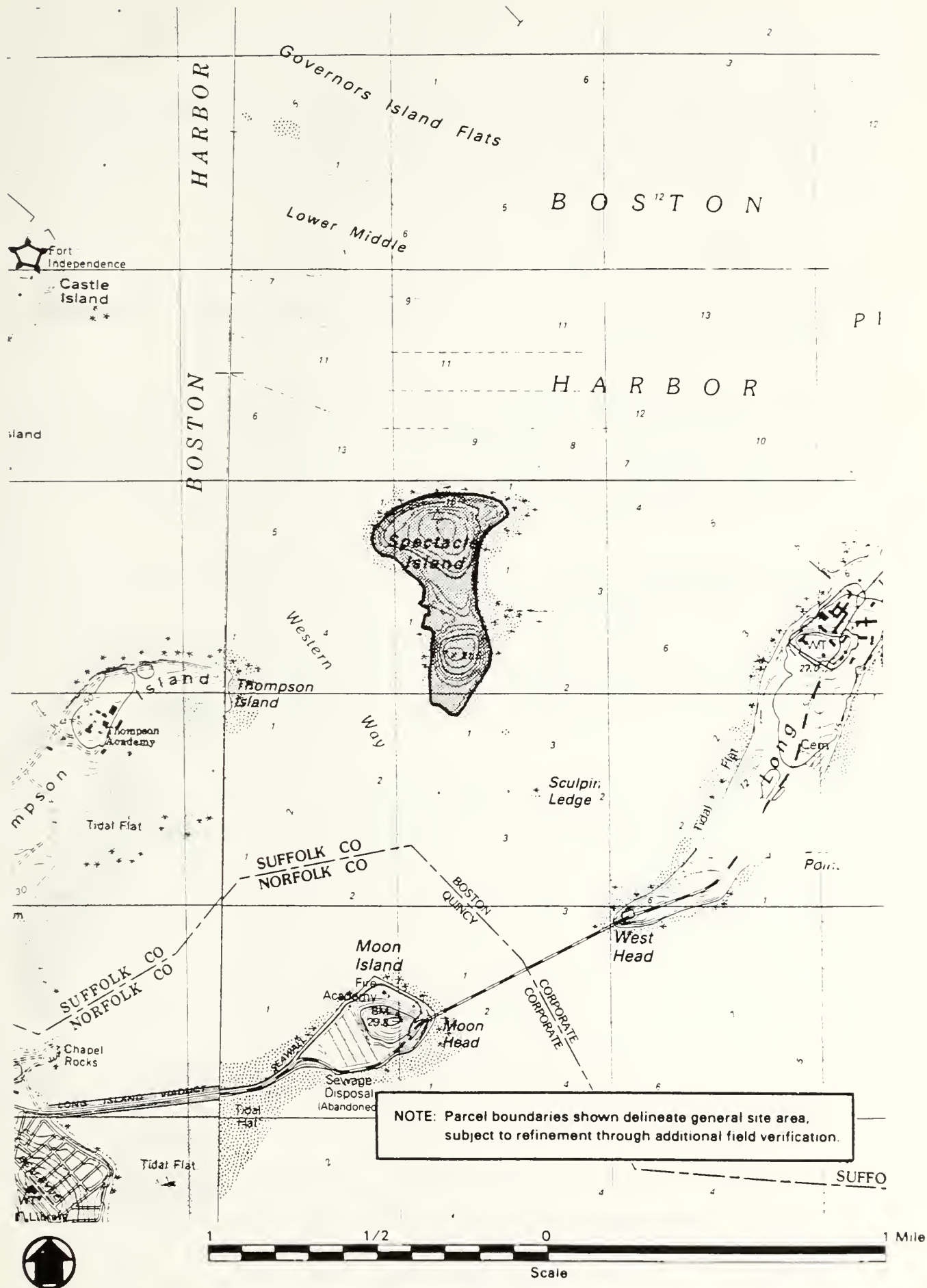
SITE DESCRIPTION: Located between Thompson Island and Long Island, Spectacle Island has approximately 77 available acres. The island is zoned industrial. Currently, the island has 40% open land and is 60% forested. An abandoned grease extraction plant, including a 90-foot draft chimney remain on the island. Years of trash dumping have increased the size of the island by 35 acres. Underground fires are reported to still smolder in the piles of garbage estimated to be over 100 feet deep in places.

Based on the previous uses of the Island, no on-site environmental resources were identified that would preclude use for residuals program activity. The site area has no major wetland areas or surface water bodies. The site has no active land use and is well separated from adjacent coastal development.

Use of Spectacle Island for residuals processing will require evaluation of the magnitude of contamination resulting from the previous industrial and landfilling activities. Other considerations include: (1) the geotechnical requirements for site development given the extent of landfilling on-site, (2) competing public sector project

demands (i.e.- use of Island area for disposing of fill removed for Central Artery project), (3) the transportation system requirements of an island site location, and (4) the compatibility with Boston Harbor master plan objectives.

OWNERSHIP: Spectacle Island is owned by the City of Boston.



Location of BOS-25

LOCATION: Coastal site on Lynn Harbor abutting the West Lynn Creamery to the west and the Lynn Sewage Treatment Plant to the north, City of Lynn.

SITE IDENTIFICATION CODE: LYN-02

POTENTIAL RESIDUALS PROGRAM USES: Possible uses include dewatering, coastal transfer, composting and/or combustion of residuals.

TRANSPORTATION ACCESS: Barge access to the site is via Lynn Harbor, 10 nautical miles from Deer Island. Surface Access to the site is via Route 1A. There is no rail access to the site; the nearest active rail lines are 300 yards to the southeast.

SITE DESCRIPTION: There are approximately 48 acres available on the site, which is zoned industrial. The site contains a closed landfill and part of a former drive-in theater, now used for flea markets. Abutting land uses include truck parking for the West Lynn Creamery, the Lynn Wastewater Treatment Plant, and a sludge/ash landfill.

Use of the site for residuals program activity is facilitated by its undeveloped nature and general industrial and retail commercial land use setting. The 48 net usable acres of the total site are bisected by wetlands. There are no on-site surface water bodies or identified ecological resources. No land uses that would be particularly sensitive to residuals activity were identified in the immediate area of the site. Marine transportation between Deer Island and the site is facilitated by the location within Lynn Harbor and significant water frontage. The use of this site may afford some opportunity to consolidate the residuals management needs of the Lynn Water and Sewer Commission and the MWRA

The previous use of portions of the site for landfilling generate the need for geotechnical evaluation of foundation suitability and potential contamination. Route 1A, the primary regional highway

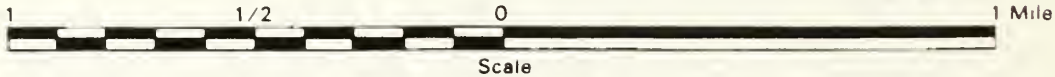
facility serving the site, is characterized by high traffic demand with periods of congestion. The ability of the site access highway network to accommodate residuals program traffic will require evaluation.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Lynn Marine Industrial Park, Inc.	+ 21 acres
Lynn Water and Sewer Commission	+ 14 acres
West Lynn Creamery	+ 5 acres
Undertermined	+ 10 acres



NOTE: Parcel boundaries shown delineate general site area, subject to refinement through additional field verification.



Location of LYN-02

LOCATION: The Quincy Shipyard, located on the Fore River, City of Quincy and Town of Braintree.

SITE IDENTIFICATION CODE: QUI-07

POTENTIAL RESIDUALS PROGRAM USES: Possible uses include dewatering, coastal transfer, composting, and/or combustion of residuals.

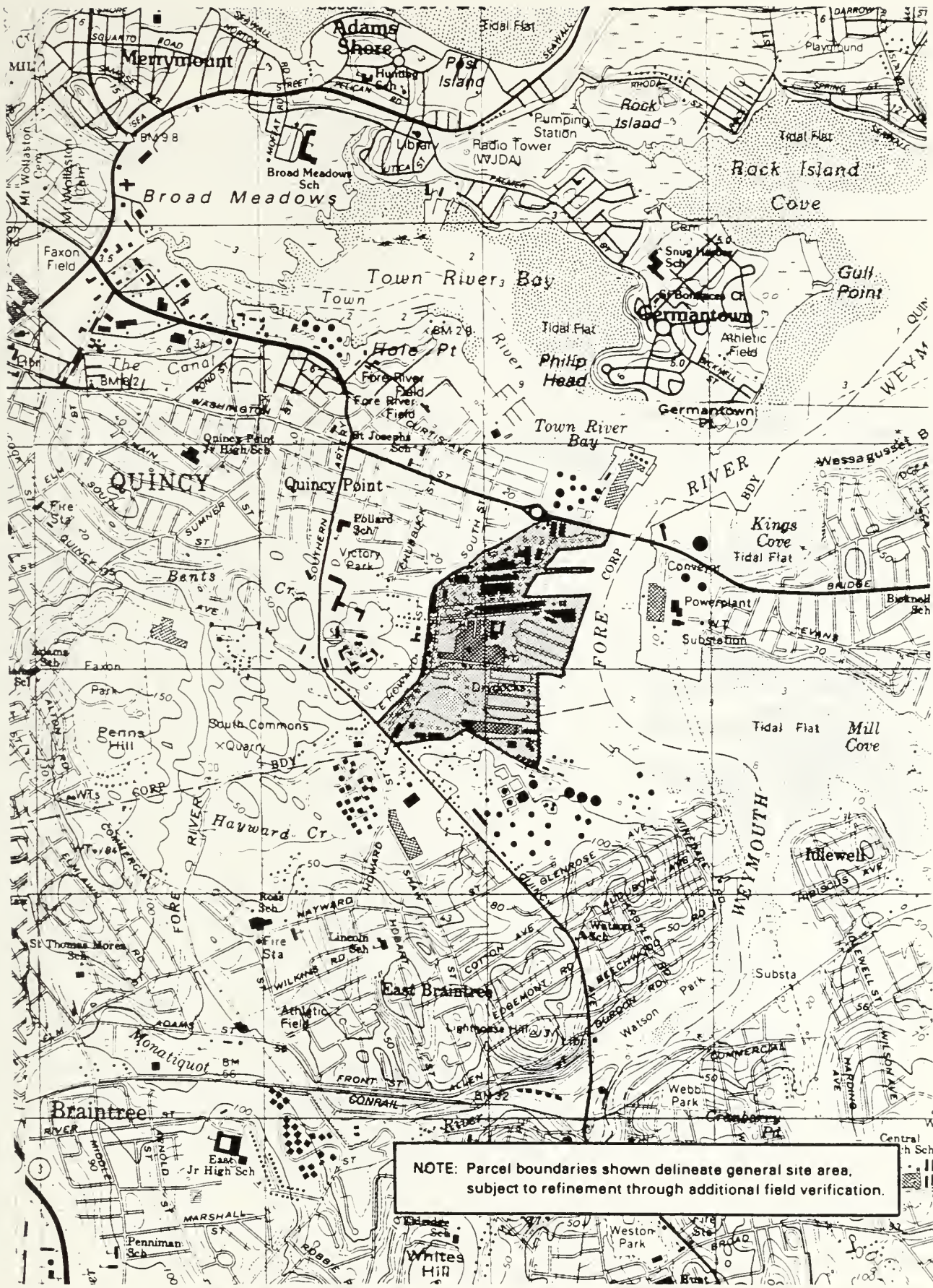
TRANSPORTATION ACCESS: Barge access via the Fore River, under the Fore River bridge (33 feet vertical clearance at mean low water), 9 nautical miles from Deer Island. Surface access to the site is from I-93, via Route 3A through Quincy, Braintree or Weymouth. Principal access is from East Howard Street. There are existing rail spurs onsite.

SITE DESCRIPTION: There are approximately 150 acres of industrially zoned land available on this site, an abandoned ship building operation. Abutting land uses include residential areas to the south, mixed commercial and residential uses to the west along Howard Street, and a hazardous waste facility operated by Clean Harbors to the east on the opposite side of the Fore River. Some buffering between the site and residential land uses exists.

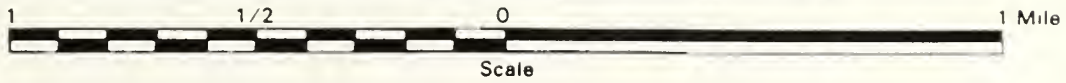
The previous heavy industrial activity on the site has resulted in an infrastructure that would facilitate reuse for residuals program activity. Marine transportation from Deer Island to the shipyard is facilitated by the existing pier and berthing facilities. The site has rail access. Due to the extent of the previous shipyard operations, no major environmental resources are identified. Some portion(s) of the site have been affected by hazardous waste contamination.

Highway access to the site is dependant upon use of facilities heavily utilized by commuters. Potential residuals program impacts on residential areas abutting the site on the south and west will require evaluation.

OWNERSHIP: The site is owned by General Dynamics and is for sale.



NOTE: Parcel boundaries shown delineate general site area, subject to refinement through additional field verification.



Location of QUI-07

LOCATION: Inland site located between Routes 24 and 139, Town of Stoughton.

SITE IDENTIFICATION CODE: STO-06

POTENTIAL RESIDUALS USES: Possible uses for the site include composting and/or combustion of residuals.

TRANSPORTATION ACCESS: Access to the site is via Route 24 south to Route 139 (Turnpike Street). The nearest rail lines are approximately 1.5 miles northeast from the site and are currently inactive.

SITE DESCRIPTION: There are approximately 90 acres of land available on the site, which is zoned industrial. Approximately 70% of the site is forested, 15% is open land, and the remaining portion is associated with an abutting asphalt plant operation. A 150 foot wide power transmission line right-of-way traverses the site. Abutting land use include Route 24 and forested land to the east, industrial development to the northwest, forested land to the southeast, west, and south, and commercial activity to the southwest. The nearest residential area is to the south, buffered by a major new commercial/industrial development and forested land.

The general geological characteristics of the site can support residuals development activity. Some excavation of bedrock out cropping would be required for site preparation. The net usable 90 acres on-site have no major wetlands or surface water bodies. Depth to groundwater is good with an aquifer classified as "low yield". The primary adjacent land uses are industrial and commercial. Scattered single-family residential development is interspersed to the north and south. Highway access to the site provided by Route 24 and Route 139 is good.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Simeone Stone Corp.	+ 28 acres
Mass Broken Stone	+ 27 acres
Stoughton Crushed Stone	+ 26 acres
F. Masina	9 acres
F. O'Niell	9 acres

LOCATION: Inland site west of Washington Street by Conrail tracks, Town of Walpole.

SITE IDENTIFICATION CODE: WLP-07

POTENTIAL RESIDUALS PROGRAM USES: Possible uses include composting and/or combustion of residuals.

TRANSPORTATION ACCESS: Access to the site is from Washington Street, via Route 1 and High Plain Street. There is also rail access to the site.

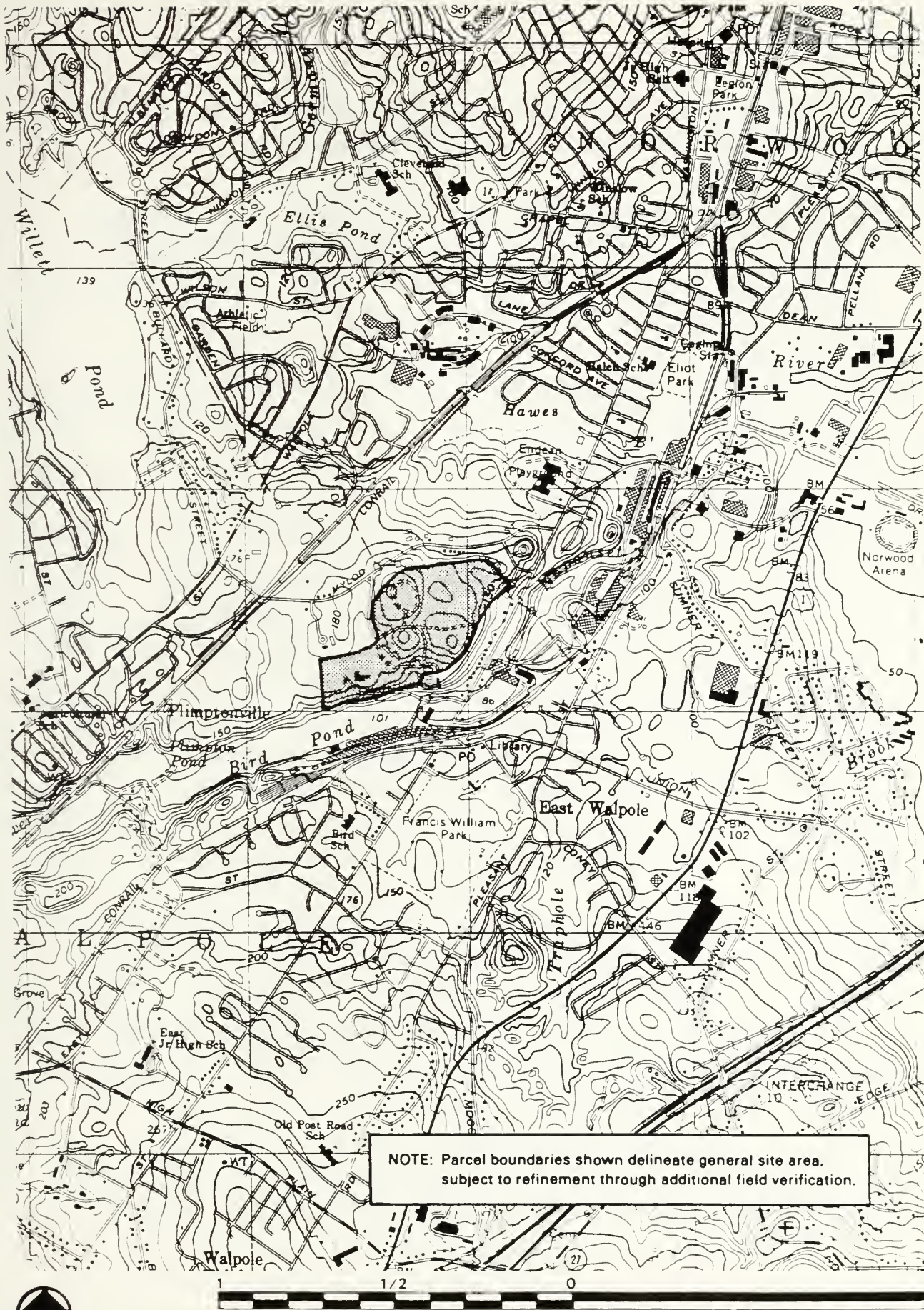
SITE DESCRIPTION: There are approximately 75 acres available on the site, which is zoned for limited manufacturing. 13.6 acres of the site are currently for sale (Bird & Son property). Current site use is mostly forested with a vacant industrial building and associated parking areas. Abutting land uses include residential to the north and northeast, forest to the west, and abandoned industrial uses to the south. The forested nature of the site provides significant buffering potential.

Due to the general site elevation, no wetland areas or surface water bodies are present. The site has no active use. A currently vacant office building represents the only development on-site. The depth to the groundwater table averages ten feet or more. The underlying groundwater aquifer is classified as "negligible yield".

Land use immediately adjacent to the site on the north and east is medium density single-family residential. Highway access to the site would require use of Washington Street, an arterial facility with abutting residential development. Key considerations related to site use include visibility from residential development and potential effect on noise environment.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Frances William Park Trust	+ 38 acres
Charles Bird	+ 8 acres
February Realty Trust	+ 14 acres
Home Building Co.	+ 15 acres



Location of WLP-07

LOCATION: Inland site off Ballardvale Road adjacent to the Wilmington Industrial Park, Town of Wilmington.

SITE IDENTIFICATION CODE: WIL-08/09

POTENTIAL RESIDUALS PROGRAM USES: Possible uses include composting and/or combustion of residuals.

TRANSPORTATION ACCESS: I-93 north to Route 125 east onto Ballardvale Road, There is no onsite rail access; the nearest active lines are approximately 500 yards west of the site.

SITE DESCRIPTION: Currently there are approximately 50 acres available on the site, however, the area is under significant development pressure. Approximately 10% of the site is zoned industrial, and 90% is zoned residential. Portions of the site not currently being developed are forested. The Wilmington Industrial Park, to the north, is a new light industrial development. The nearest residences are to the east and buffered by forest. There are forested wetlands and an industrial/commercial development to the southwest. Development plans have been submitted for the residentially-zoned portion of the site, but lack of an agreement with Andover for sewer connections has precluded permit approval.

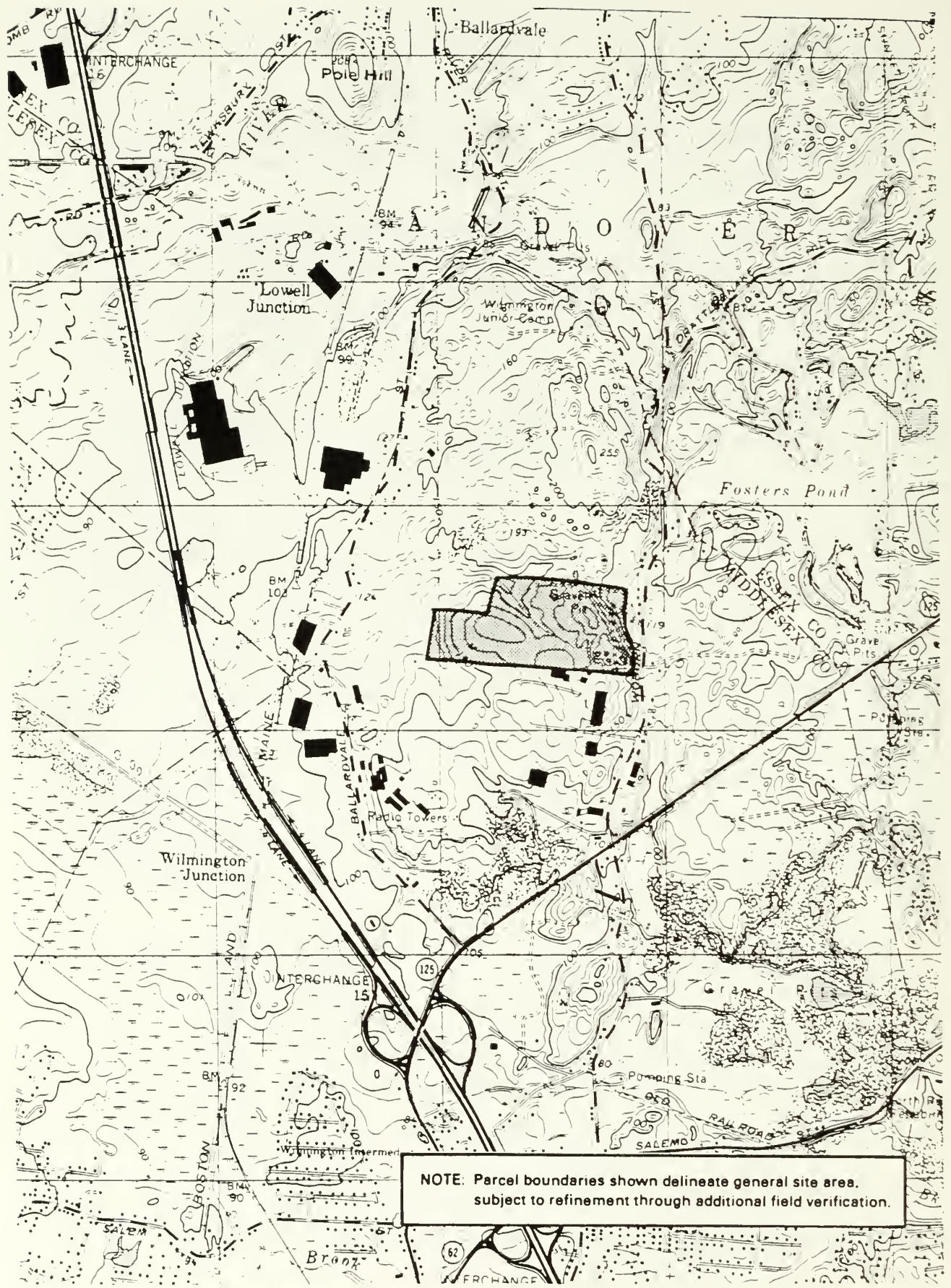
The soils and geology can support development of the site for residuals use. The majority of the site has no wetland areas or surface water bodies. The site is underlain by a "low yield" aquifer. The site is located in a developing light industrial and commercial office land use setting. Highway access to the site provided by I-93/Route 125/Ballardvale Road is very good.

The major consideration associated with the site is the attractiveness to competing development proposals. Previous development plans have

been proposed to the Town of Wilmington for the site. No development plans have to date been approved by the Town for the site proper.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Tambone Corporation	+ 10 acres
Joseph Sciarappa	+ 40 acres



Location of WIL-08/09

LOCATION: Inland site northwest of Route 135, Town of Ashland.

SITE IDENTIFICATION CODE: ASH-18/22

POTENTIAL RESIDUALS PROGRAM USES: Possible use of the site would be for landfilling ash, grit, and screenings (and dewatered sludge on emergency basis only).

TRANSPORTATION ACCESS: Access is via Route 135. There are active rail lines bordering the site to the north.

SITE DESCRIPTION: There are approximately 290 acres available on this site. About 50% of the site is zoned industrial, and 50% residential. The site is mostly forested with the northeastern corner encompassing the 200 acre Nyanza hazardous waste site. Other abutting land uses include industrial to the north, forest to the east and west, and residential to the southeast, and agricultural land to the south. The forested nature of the site provides significant buffering potential toward the nearest residences to the southeast, west, and northwest. Ashland Junior High School is within 1/2 km to the east, but well buffered by forest. Ashland State Park is approximately 1 km to the southeast, across Route 135.

The major feature of the site is its size (290 acres) and current open space status. Site topography generally consists of moderate terrain with pockets of bedrock outcropping. The majority of the site area is underlain by a "low yield" aquifer. A small section of the northern portion of the site is underlain by a "medium yield" aquifer. Depth to bedrock averages ten feet or greater on the site. Rail access could be provided from adjacent active tracks to the north. Consideration associated with use of the site for residual program activity include: (1) proximity of Junior High School to eastern boundary, (2) known areas of contamination in northeast portion of site, (3) abutting single family residences to southeast, and (4) proximity to Ashland Reservoir. Highway access to the site would require use of Town roadways.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Albert Green	+ 35 acres
Charlie Conserva	+ 38 acres
Warren Walkup Jr., Family Trust	+ 15 acres
Town of Ashland	+ 20 acres
Charlotte Cookingham	+ 15 acres
William Higgins	+ 23 acres
Anthony Laberahon	+ 15 acres
Ashland Realty Development Corp.	+100 acres
MLT Realty Trust	+ 10 acres
MCL Development Corporation	+ 5 acres
John Ellsworth	+ 10 acres

LOCATION: Inland site located southwest of Route 3. Town of Bedford.

SITE IDENTIFICATION CODE: BED-09

POTENTIAL RESIDUALS PROGRAM USES: Possible use of the site would be for landfilling ash, grit, and screenings (and dewatered sludge on emergency basis only).

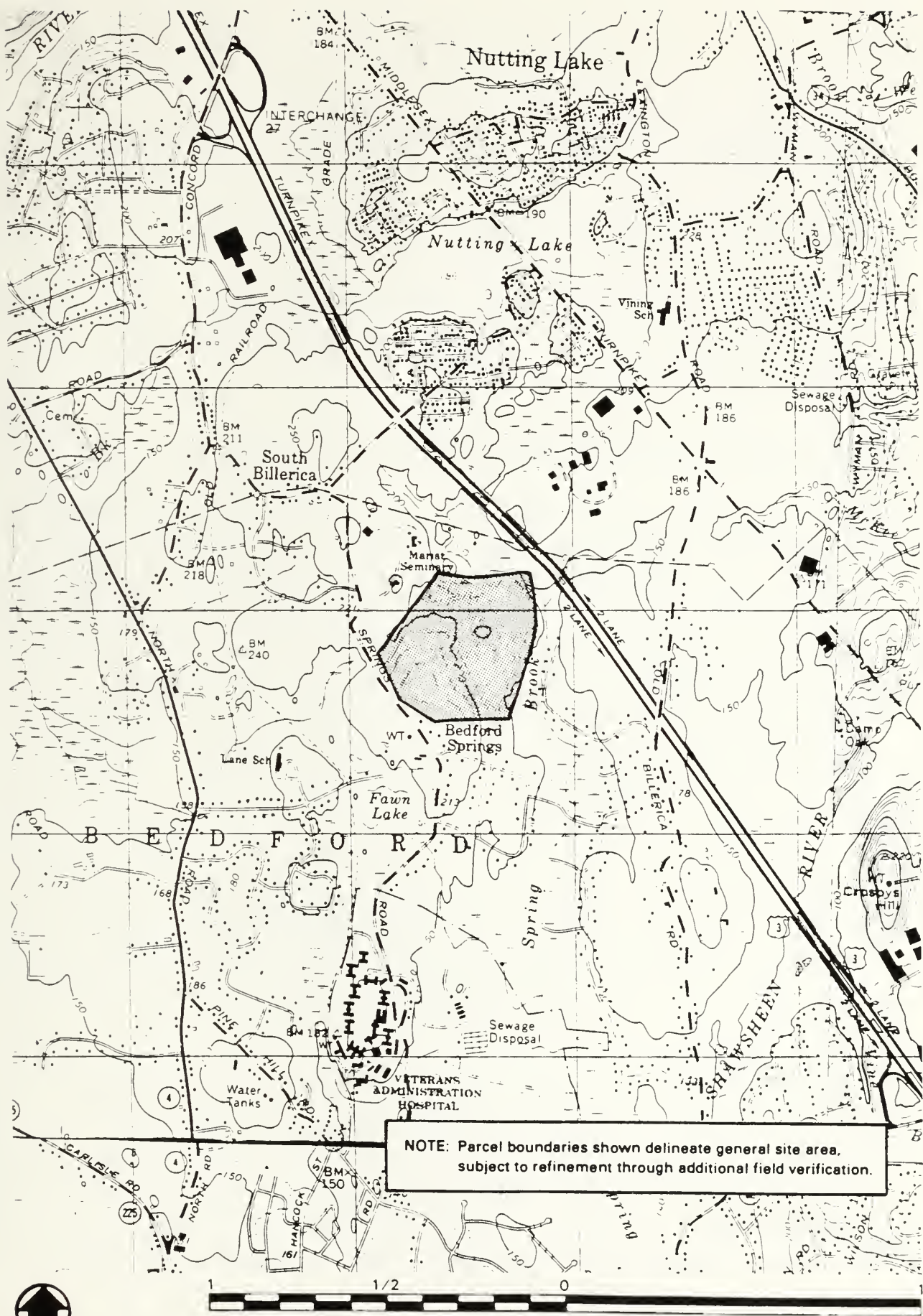
TRANSPORTATION ACCESS: Access to the site is from Route 3 north to Concord Road, south to Springs Road.

SITE DESCRIPTION: There are approximately 96 acres available on this site, which is zoned residential. The site is completely forested and abuts the Marist Seminary, and Middlesex Community College's Northern Campus to the north. There are residential uses to the south, and southeast. The densely vegetated nature of the site provides significant buffering potential.

The majority of the net usable site area has no wetlands or surface water bodies. Depth to bedrock is generally ten feet or greater. The site is underlain by a "very low yield" aquifer. adjacent land use consists of low density residential development, the Middlesex Community College North Campus buildings, and the Marist Seminary facility.

Site access would require use of town roadways from Route 3. Buffer areas would be required between site development activities and adjacent land uses.

OWNERSHIP: The site is owned by the Commonwealth of Massachusetts.



Location of BED-09

LOCATION: The Rowe Quarry, located east of Route 1, straddling the Malden/Revere line.

SITE IDENTIFICATION CODE: MAL-01

POTENTIAL RESIDUALS PROGRAM USES: Possible use for the site would be for landfilling ash, grit, and screening (and dewatered sludge on emergency basis only).

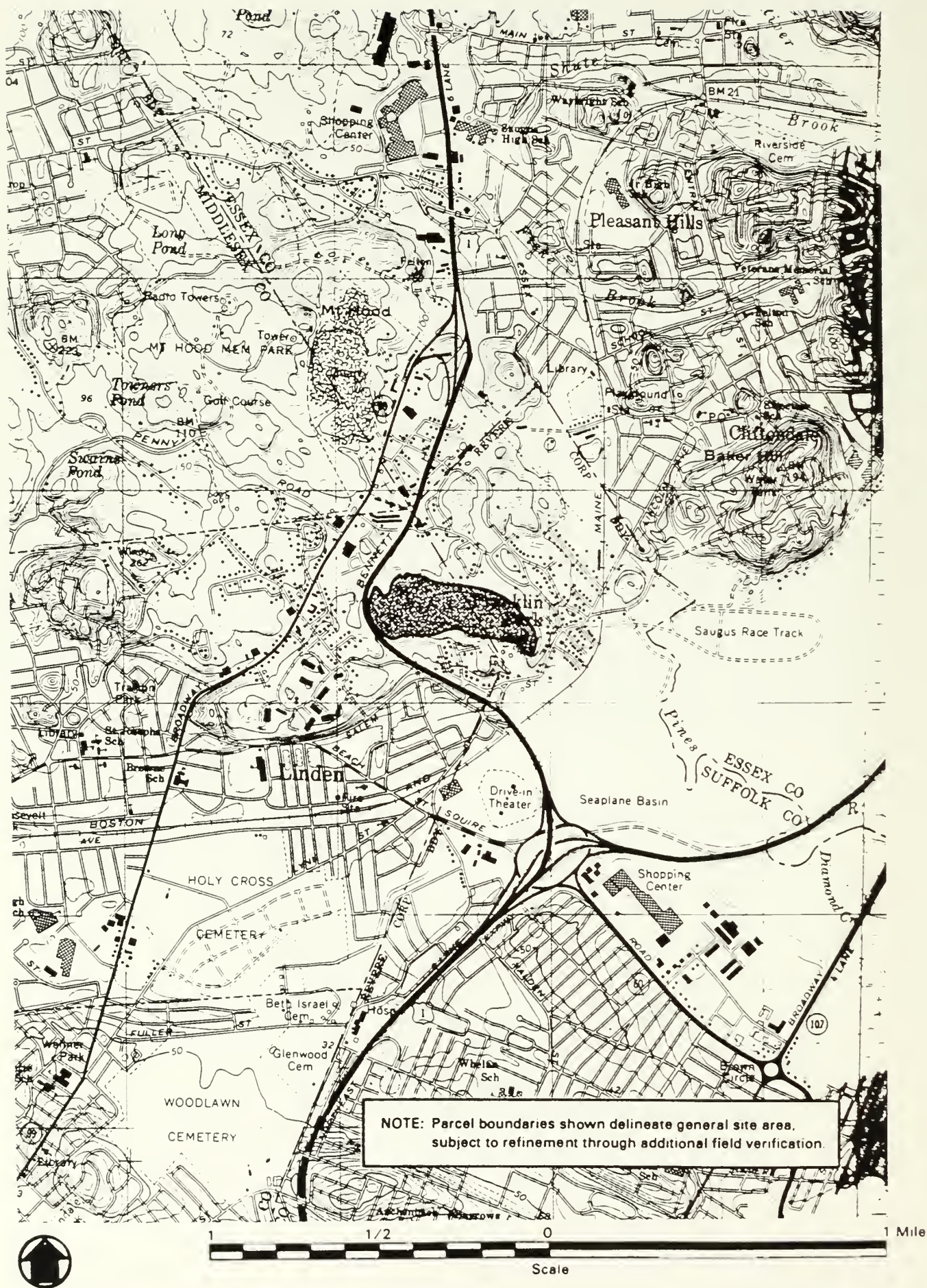
TRANSPORTATION ACCESS: Access to the site is via Route 1.

SITE DESCRIPTION: This approximate 42 acre site has been actively quarried since 1885. The quarry has significant vertical depth, making it well suited for landfill activities. Both the 50% in Malden and 50% in Revere portions of the site are zoned for highway business use. The site abuts Route 1 to the west, and residential areas buffered by vegetation to the north, and south. Residential uses to the east are separated by approximately 100 yards of open land. There is a nursing home on Lincoln Ave., approximately 1/4 mile to the east, and the site is approximately 1/4 mile southeast of the Mt. Hood Memorial Park.

The environmental characteristics of the dry quarry make the site suitable for use as a landfill. Significant potential capacity exists due to the depth of the on-going quarry operation. The site is underlain by a "very low yield" aquifer with no surface water bodies present.

Considerations associated with use of the site for residual program activity include any potential impact the Mass. DPW Route 1 realignment and upgrading might have on the quarry. Several developers have approached the current owner with proposals for acquisition and development. Use of the site for a landfill would also require consideration of adjacent residential land use.

OWNERSHIP: The site has been owned by the Rowe Contracting Company of Revere since 1910.



Location of MAL-01

LOCATION: Inland site located adjacent to Massachusetts Correctional Institute (MCI) Cedar Junction, Town of Walpole.

SITE IDENTIFICATION CODE: WLP-08

POTENTIAL RESIDUALS PROGRAM USES: Possible use for the site would be for landfilling ash, grit, and screenings (and dewatered sludge on emergency basis only).

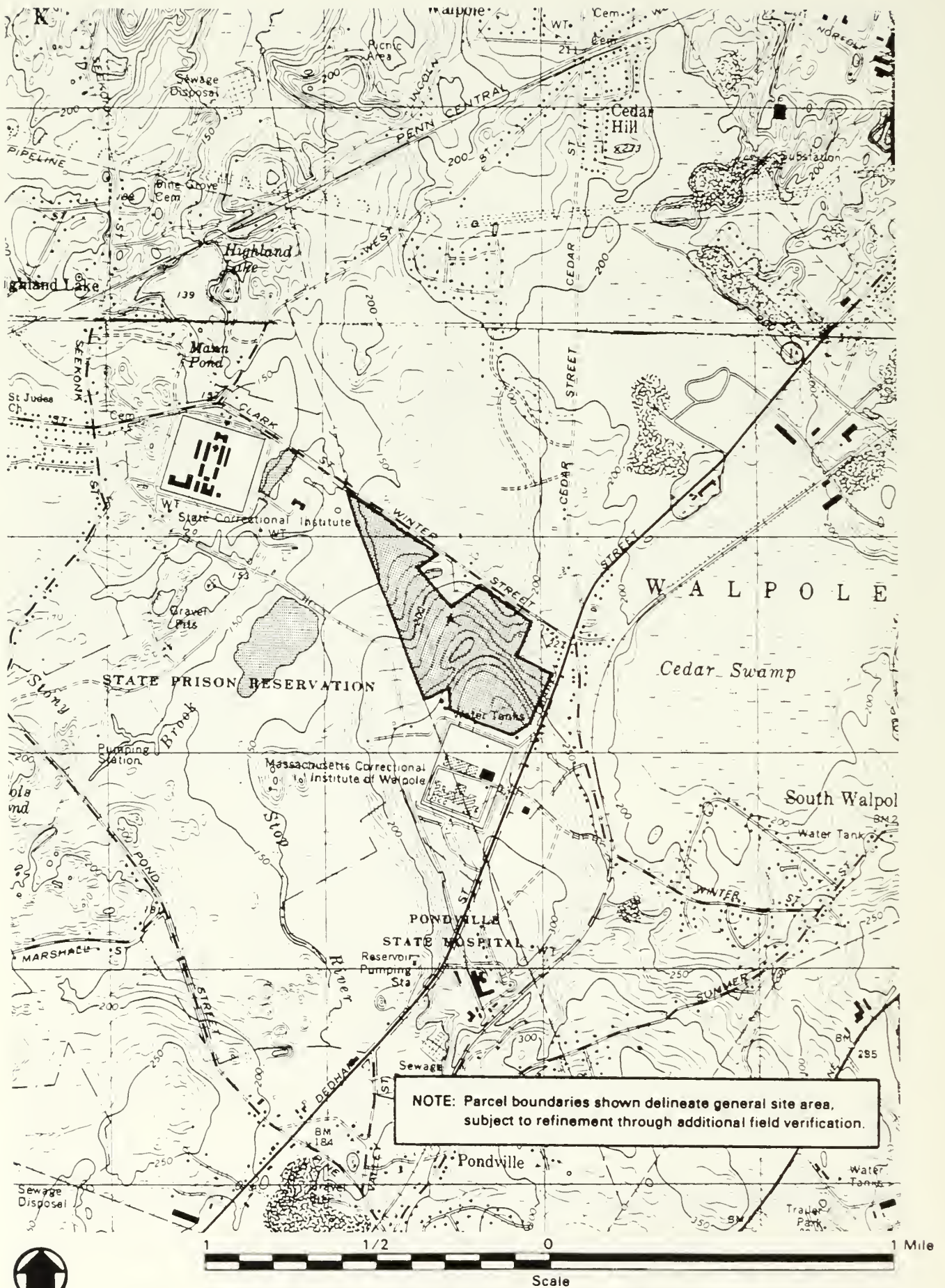
TRANSPORTATION ACCESS: Access to the site would be via Route 1A to Winter Street. There are active rail lines approximately 200 yards east of the site.

SITE DESCRIPTION: There are approximately 93 undeveloped, forested or cleared acres available in this site, which is zoned Rural. Nearby land uses include an MCI prison complex to the south, another prison complex 300 yards to the northwest (in Norfolk), the New England K-9 Academy to the east, and the Correction Institute Release Station to the west. Several residences also abut to the east, however, the forested nature of the site provides significant buffering potential. Pondville State Hospital is approximately 1/2 mile to the south, beyond the prison.

The site is characterized by well-drained soils with bedrock averaging ten feet or greater below the ground surface. A small man-made pond abuts the site along the northeast boundary edge. No major on site wetlands are identified. The aquifer under the site is classified as "very low yield". Access the site is provided by Route 1A, a two-lane arterial roadway.

Use of the site would require maintenance of a physical buffer area with the adjacent residences to the east and north.

OWNERSHIP: The site is owned by the Commonwealth of Massachusetts.



Location of WLP-08

LOCATION: Inland site located adjacent to Route 109 and North Street, Town of Walpole.

SITE IDENTIFICATION CODE: WLP-13/15

POTENTIAL RESIDUALS PROGRAM: Possible use for the site would be for landfilling ash, grit, and screenings (and dewatered sludge on emergency basis only).

TRANSPORTATION ACCESS: Access to the site is via Routes 128/95 to High Street and North Street. Alternative access is via Route 109. There is no rail access.

SITE DESCRIPTION: This site consists of a very large tract of land bisected by a wetlands area, leaving approximately 675 acres of usable land. Current land use includes a portion of the Norfolk County Ecological Laboratories property, which are off-site to the east and extend approximately 400 yards onto the site. Most of the remainder of the site is forested, with some agricultural use. A 150 foot wide power line right-of-way traverses the site. The entire site is zoned Rural. Abutting land uses include an extensive residential development to the north, sparse residential development to the east, and new residences to the south. The size of the site and its forested condition provide significant buffering potential in all directions.

The topography of the site consists of moderate to hilly terrain. Soils vary throughout the site with the majority of the are identified as well drained with stable characteristics. A large wetland area effectively splits the site into two parcels. Several small streams traverse the non-wetland areas. The site is entirely underlain by a "low yield" aquifer. Site access is provided by Route 109, a two-lane arterial roadway.

With respect to residual facility development potential, a portion of the site is dedicated conservation land owned by the Town of Walpole. Buffer areas would be required between the single family residential development abutting the site to the north, east and south.

OWNERSHIP: The following identification of site owners and acreage values is approximate and based upon the best available information to date:

Unidenified	+ 45 acres
Kenneth Isaacs	+260 acres
Norfolk County	+ 80 acres
James Patten	+ 40 acres
Town of Walpole	+ 50 acres
Joseph T. Falcone	+ 30 acres
Boston Edison	+ 15 acres
Barbara Peirce, George Fales	+ 10 acres
Willard Tetar Parker	+ 40 acres
Bruce & Brenda Rieth	+ 20 acres
Jean T. Swaim	+ 30 acres

CHAPTER 3

DESCRIPTION OF CANDIDATE OPTIONS

A. INTRODUCTION

As noted in Chapter 1, the terminology **candidate option** comes from the MEPA Special Procedure, which directed that a reasonable number of alternatives (candidate options) for future residuals management be identified and evaluated in detail. Each candidate option will be a unique combination of technologies, sites, and transportation modes and routes.

By matching the seven system alternatives that were recommended for further evaluation in Chapter 1, with the two island, two coastal, and three inland processing sites identified in Chapter 2, 25 candidate options (site/technology combinations) are formed. These candidate options are summarized in Table 3-1. Also listed are an additional six candidate options that are potentially viable as a result of Spectacle Island being selected for further evaluation. Therefore, a total of 31 candidate options have been identified that will be the subject of detailed engineering and environmental analyses in the upcoming Candidate Options Evaluation. The process described in Chapter 1 for identifying system alternatives was conducted concurrently with and independently from the Site Screening Analysis. In Chapter 1 of this report the G system alternative, which called for accommodating both composting and combustion on Deer Island, was initially screened out due to land area limitations on Deer Island. As noted in Chapter 2, Spectacle Island ranked very highly in the site screening process and was selected along with Deer Island to be evaluated in more detail as a possible site for some component of the residuals management program. With the larger land area available on Spectacle Island, this island either alone or in combination with Deer Island could potentially accommodate both technologies; thus, creating an additional six candidate options.

TABLE 3-1

SUMMARY OF CANDIDATE OPTIONS

<u>System Alternative Reference**</u>	<u>Island Location</u>	<u>Coastal Location</u>	<u>Inland Processing Location</u>	<u>Inland Land Disposal Location</u>
P8-01	NA	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting/combustion	*
P8-02	NA	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting/combustion	*
P8-03	NA	LYNN SITE o transfer	WILMINGTON SITE o composting/combustion	*
N8-01	NA	QUINCY SHIPYARD o transfer/composting	WALPOLE SITE o combustion	*
N8-02	NA	QUINCY SHIPYARD o transfer/composting	STOUGHTON SITE o combustion	*
N8-03	NA	LYNN SITE o transfer/composting	WILMINGTON SITE o combustion	*
L8-01	NA	QUINCY SHIPYARD o transfer/combustion	WALPOLE SITE o composting	*
L8-02	NA	QUINCY SHIPYARD o transfer/combustion	STOUGHTON SITE o composting	*
L8-03	NA	LYNN SITE o transfer/combustion	WILMINGTON SITE o composting	*
K8-01	NA	QUINCY SHIPYARD o transfer, composting, combustion	NA	*
K8-02	NA	LYNN SITE o transfer, composting, combustion	NA	*
J5-01	DEER ISLAND o composting	QUINCY SHIPYARD o transfer/combustion	NA	*
J5-02	DEER ISLAND o composting	LYNN SITE o transfer/combustion	NA	*
J5-03	SPECTACLE ISLAND o composting	QUINCY SHIPYARD o transfer/combustion	NA	*
J5-04	SPECTACLE ISLAND o composting	LYNN SITE o transfer/combustion	NA	*
I7-01	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting	*

TABLE 3-1 (CONT)
SUMMARY OF CANDIDATE OPTIONS

<u>System Alternative Reference**</u>	<u>Island Location</u>	<u>Coastal Location</u>	<u>Inland Processing Location</u>	<u>Inland Land Disposal Location</u>
I7-02	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting	*
I7-03	DEER ISLAND o combustion	LYNN SITE o transfer	WILMINGTON SITE o composting	*
I7-04	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	WALPOLE SITE o composting	*
I7-05	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	STOUGHTON SITE o composting	*
I7-06	SPECTACLE ISLAND o combustion	LYNN SITE o transfer	WILMINGTON SITE o composting	*
H7-01	DEER ISLAND o combustion	QUINCY SHIPYARD o transfer/composting	NA	*
H7-02	DEER ISLAND o combustion	LYNN SITE o transfer/composting	NA	*
H7-03	SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer/composting	NA	*
H7-04	SPECTACLE ISLAND o combustion	LYNN SITE o transfer/composting	NA	*
G5-01	SPECTACLE ISLAND o combustion/ o composting	QUINCY SHIPYARD o transfer	NA	*
G5-02	SPECTACLE ISLAND o combustion/ o composting	LYNN SITE o transfer	NA	*
G5-03	DEER ISLAND o combustion SPECTACLE ISLAND o composting	QUINCY SHIPYARD o transfer	NA	*
G5-04	DEER ISLAND o combustion SPECTACLE ISLAND o composting	LYNN SITE o transfer	NA	*
G5-05	DEER ISLAND o composting SPECTACLE ISLAND o combustion	QUINCY SHIPYARD o transfer	NA	*
G5-06	DEER ISLAND o composting SPECTACLE ISLAND o combustion	LYNN SITE o transfer	NA	*

NA - Not Applicable

* - Landfill sites proposed for further evaluation include the Malden quarry, Ashland site, two sites in Walpole, and the Bedford site.

** System alternatives P, N, L, K, J, I, and H are the "general" system alternatives that were recommended for further evaluation in Chapter 1.

As noted in Chapter 1, all of the candidate options call for the use of two technologies for long-term management of sludge (composting and combustion), and rely on landfilling for the disposal of grit, screenings, and ash from the combustion process. The landfill would also provide emergency backup disposal for dewatered sludge.

The MWRA's residuals consultant has preliminarily proposed that only composting facilities be constructed initially, to coincide with the startup of the new consolidated primary treatment facilities in 1995. Combustion facilities would be added several years later, when sludge quantities nearly double with the startup of the new secondary treatment facilities. This proposed staging, or timing plan will be evaluated in greater detail during the Candidate Options Evaluation to ensure that adequate reliability would be provided during the period 1995-1999, when only composting facilities would be on-line and landfilling would be the only backup disposal method. At issue is whether or not all of the compost produced from the processing of 100 percent of the primary sludge could be distributed for beneficial uses beginning in 1995. To aid in resolving this issue, the Authority's consultant and staff will be undertaking a number of related activities in the months ahead, including:

- o possible follow-up greenhouse studies to the one that was recently completed during the first half of 1987, which focused on the horticultural uses of Deer Island compost.
- o carefully selected, controlled, and monitored field test demonstrations of Deer Island compost following DEQE suitability determination and site approvals.
- o possible updating of the 1986 Compost Marketing Report and development of an overall strategy for gradually implementing composting on a large scale.
- o conceptual planning for a "placement" program in which MWRA compost could be placed with large institutional users as topdressing for turf area and landscape maintenance until a revenue-producing market could be developed.
- o preparation and submittal to DEQE of suggested compost distribution guidelines that would simplify the administrative requirements associated with a compost distribution program, while assuring adequate safeguards for protection of public health and the environment.

- o identification of measures to supplement the current MWRA Industrial Pretreatment Program in reducing contaminant loadings to the Authority's treatment plants, thereby enhancing compost quality.

The combustion element of the proposed management plan will also receive in-depth review in the Candidate Options Evaluation, with emphasis on the operability of preprocessing technologies, and characterization and control of air emissions.

All of the candidate processing sites (two island, two coastal, three inland) can accommodate either or both major technologies, with the exception of Deer Island which can accommodate either one but not both. Therefore, a final decision on the proposed staging plan is not a prerequisite to the conduct of the evaluation of the candidate options, nor to the decision-making process that will lead to the selection of a preferred option (including specific sites).

The 31 candidate options include various combinations of locating the two major technologies either together at the same site or separately at two locations. It would also be possible to utilize multiple composting and multiple combustion facilities at various locations to satisfy future residuals management needs. Full consideration of this possibility at this early stage of the planning process is not practical because of the hundreds of possible technologies/sites combinations that would result. However, later in the planning process when the impacts of concentrating the facilities at single sites have been determined, it will be possible to evaluate whether facilities at multiple sites from among the 12 sites identified would be desirable. However, evaluation of multiple site options must also account for the resulting multiple transportation routes and associated impacts.

Five of the 12 sites recommended for further evaluation were identified as potential sites for ash, grit, and screenings landfilling. During the upcoming Candidate Options Evaluation these sites will not initially be matched with specific candidate processing and coastal transfer sites, but instead will be carried as a "pool" of sites. The best, or most acceptable site will

be selected for fulfilling the minor residuals landfilling need, irrespective of which site/technology combination is selected for sludge management. This is possible because a significant portion of the residuals to be landfilled originate at a number of headworks facilities at dispersed locations in the MWRA service area, and only 3 to 5 truck trips per day will be required to transport ash from the combustion processing site to the landfill. Therefore, the proximity of the landfill site to the other sites selected for residuals processing and coastal transfer is not a critical concern. As described in Chapter 2, the "pool" of sites to be evaluated for fulfilling the need for a minor residuals landfill consists of:

- o Magunco Hill and area north, Town of Ashland (ASH-18/22)
- o Commonwealth of Massachusetts near Middlesex Community College, Town of Bedford (BED-09)
- o the Rowe Quarry, straddling the Malden/Revere line (MAL-01)
- o Commonwealth of Massachusetts near MCI Cedar Junction, Town of Walpole (WLP-08)
- o site in North Walpole (WLP-13/15)

Evaluation criteria to facilitate the selection of a preferred landfill site as well as a preferred candidate option are currently under development, and will be submitted to the MWRA Board of Directors for approval following a period of public and agency review. Included will be such factors as cost, technical feasibility, environmental and community impacts, and equitable distribution of regional responsibilities.

B. SUMMARY DESCRIPTIONS OF THE CANDIDATE OPTIONS

Since the candidate options are formed by matching specific processing and coastal transfer sites with the system alternatives presented in Chapter 1, the following presentation of the candidate options has been arranged into "families" of candidate options

according to the system alternatives from which they were derived. The reader is referred to Chapter 1 for a description of the system alternative development process and nomenclature.

The "P" Family of Candidate Options call for both **composting and combustion of sludge at a common inland processing site**. Three site/technology combinations are possible under this residuals management scenario, which are illustrated on Figure 3-1. Brief descriptions of these candidate options follow.

- o P8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer onto truck or rail for transport to the **Walpole** processing site. A portion of the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Walpole site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o P8-02 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer onto truck for transport to the **Stoughton** processing site. A portion of the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Stoughton site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o P8-03 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site either by barge or pipeline, for dewatering and transfer onto truck for transport to the **Wilmington** processing site. A portion of

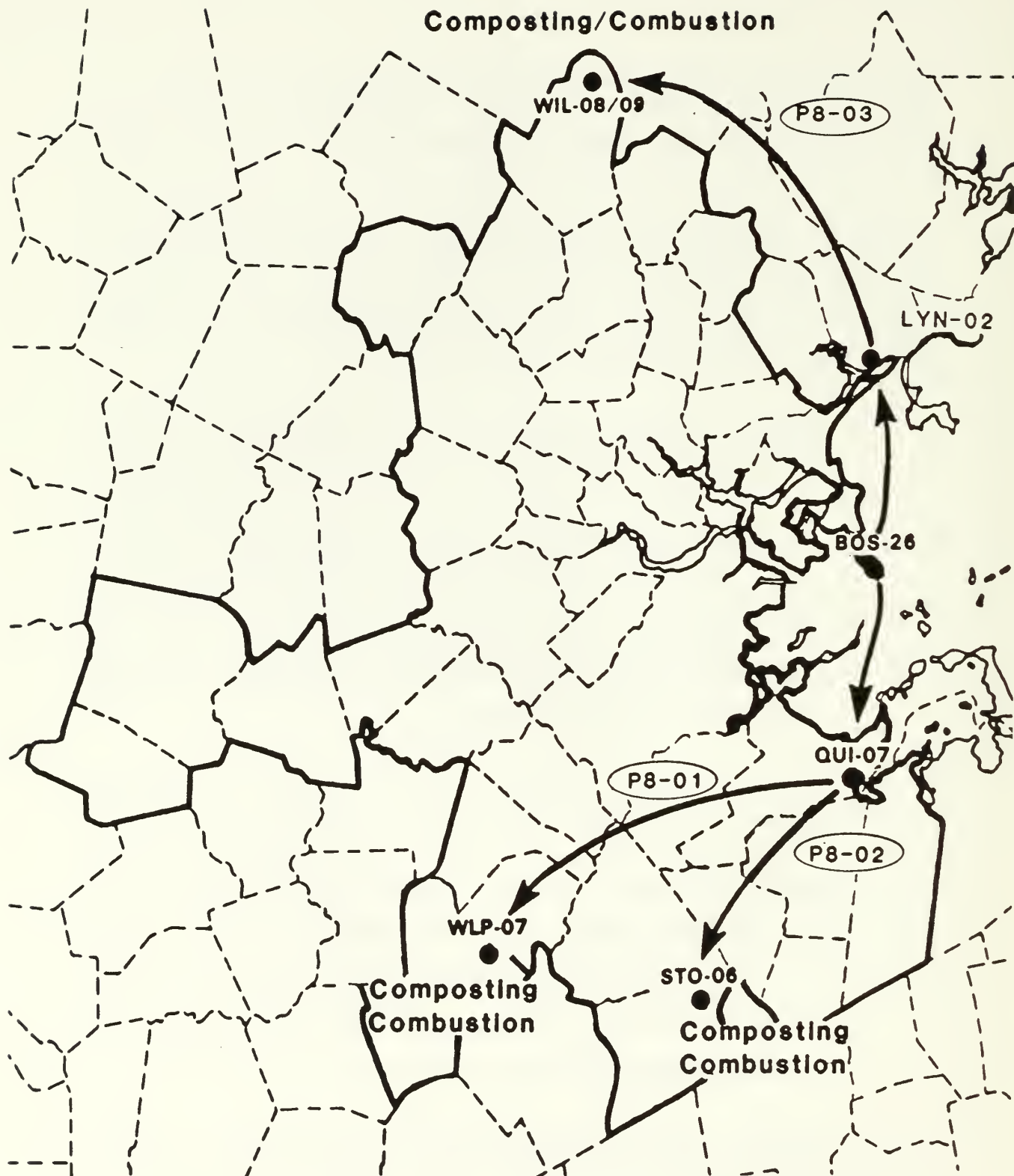


Figure 3-1
The "P" Family of Candidate Options

Composting and combustion are located at the same inland processing site. Coastal site is used for dewatering and materials transfer only. Minor residuals are disposed at inland landfill (not shown)

the sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Wilmington site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "N" Family of Candidate Options call for **composting** of a portion of the sludge **at a coastal site**, with **combustion** of the balance **at an inland processing site**. Three site/technology combinations are possible under this management scenario, which are illustrated on Figure 3-2. Brief descriptions of these candidate options follow:

- o N8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the shipyard for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck or rail to the **Walpole** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill.

- o N8-02 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the shipyard for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck to the **Stoughton** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill for ultimate disposal.

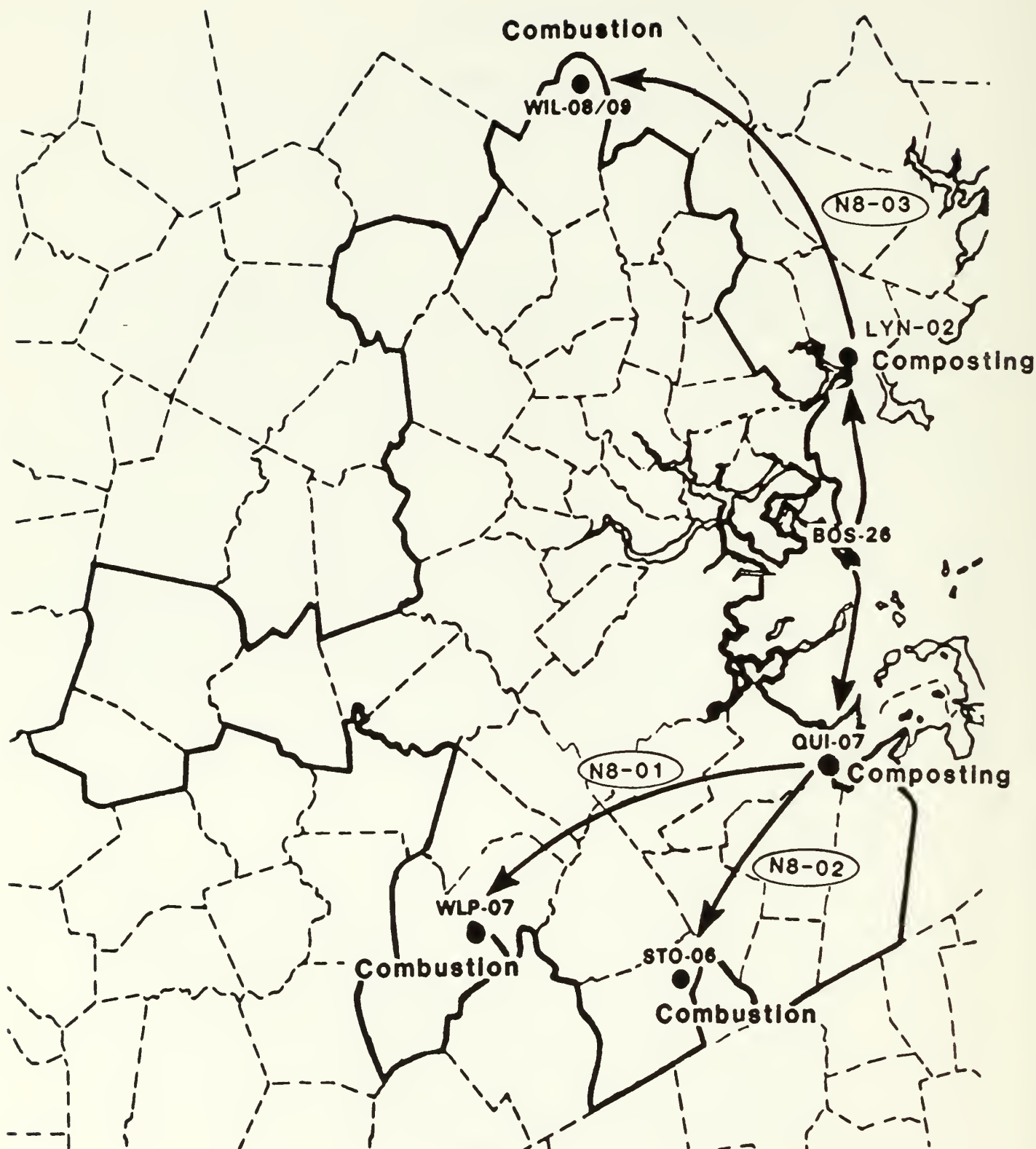


Figure 3-2

The "N" Family of Candidate Options

Combustion is located at an inland processing site. Coastal site is used to accommodate dewatering, composting, and materials transfer. Minor residuals are disposed at inland landfill (not shown).

- o N8-03 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering. A portion of the sludge would be dewatered and composted at the Lynn site for distribution via truck haul to a variety of sites for beneficial uses. The balance of the dewatered sludge would be transported by truck to the **Wilmington** processing site for combustion. Ash from the combustion process would be hauled by truck to the minor residuals landfill.

The "L" Family of Candidate Options interchange the locations for the two technologies, calling for **combustion at a coastal location** and **composting inland**. Again, three site/technology combinations are possible and are illustrated on Figure 3-3. A brief description of each follows:

- o L8-01 - Digested sludge would be transported from Deer Island to the Quincy Shipyard, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Quincy Shipyard** site. The balance of the dewatered sludge would be transported by truck or rail to the Walpole site for composting. Composted sludge would be distributed from the **Walpole** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o L8-02 - Digested sludge would be transported from Deer Island to the Quincy Shipyard, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Quincy Shipyard**. The balance of the dewatered sludge would be transported by truck to the Stoughton site for composting. Composted sludge would be distributed from the **Stoughton** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

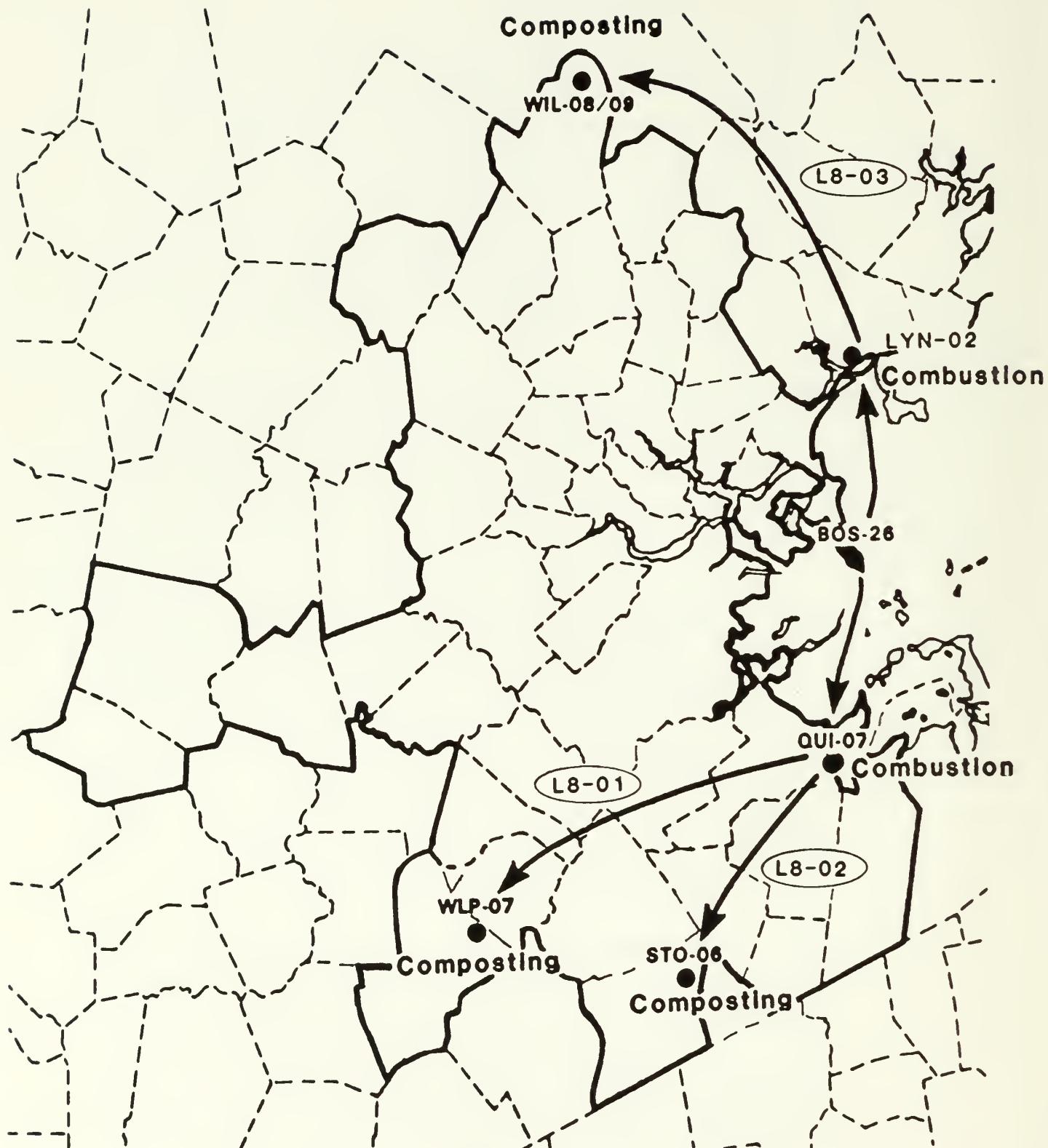


Figure 3-3

The "L" Family of Candidate Options

Composting is located at an inland processing site. Coastal site is used to accommodate dewatering, combustion, and materials transfer. Minor residuals are disposed at inland landfill (not shown).

- o L8-03 - Digested sludge would be transported from Deer Island to the Lynn South Harbor site, either by barge or pipeline, for dewatering. A portion of the sludge would be combusted at the **Lynn** site. The balance of the dewatered sludge would be transported by truck to the Wilmington site for composting. Composted sludge would be distributed from the **Wilmington** site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "K" Family of Candidate Options call for both **composting and combustion** of sludge at a **common coastal processing site**. Two site/technology combinations are possible under this residuals management scenario, both are illustrated on Figure 3-4. A brief description of these candidate options follows:

- o K8-01 - Digested sludge would be transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. A portion of the dewatered sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Quincy Shipyard site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o K8-02 - Digested sludge would be transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, from dewatering. A portion of the dewatered sludge would be composted, the balance would be combusted. Composted sludge would be distributed from the Lynn site to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

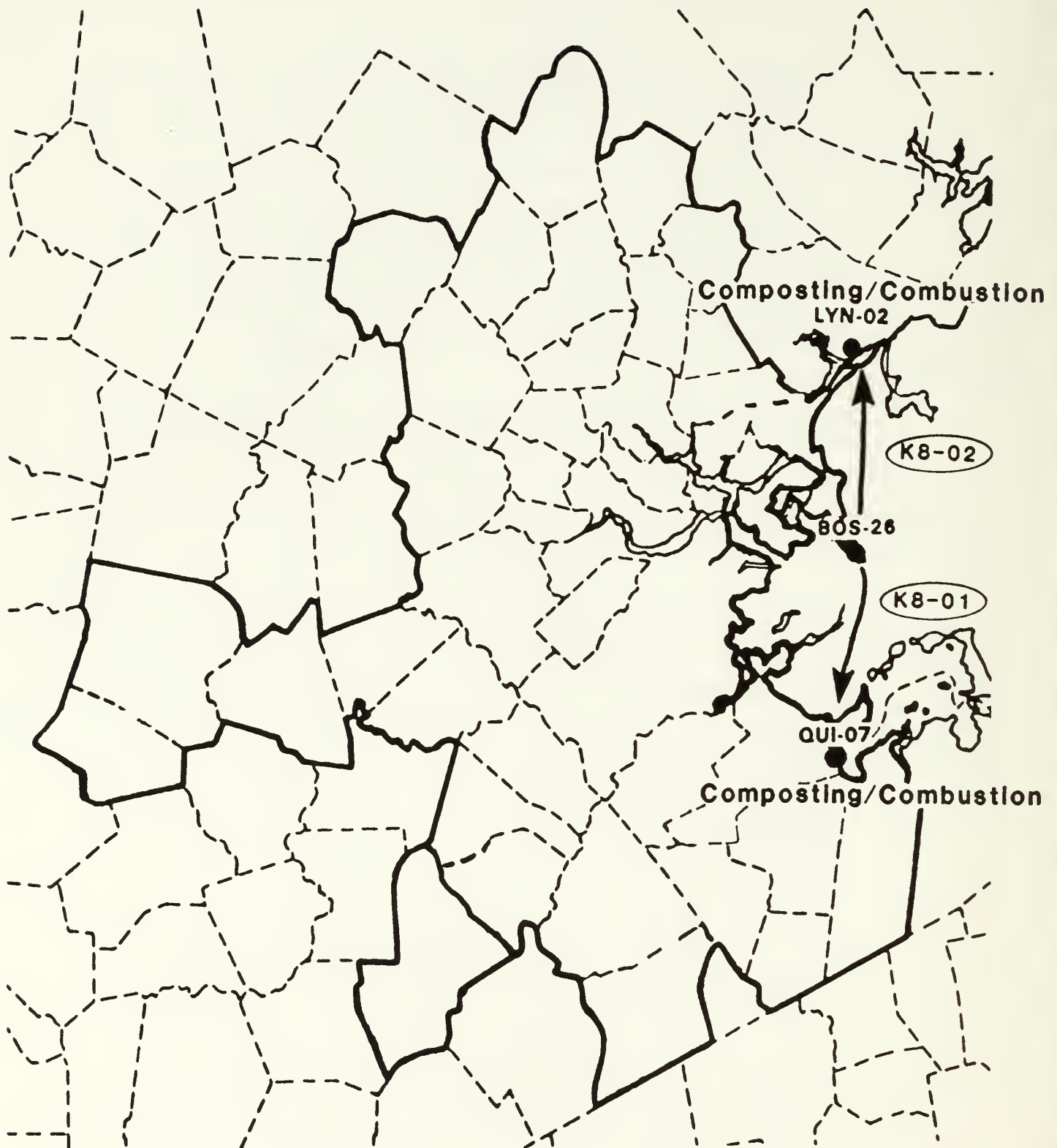


Figure 3-4

The "K" Family of Candidate Options

Composting and combustion are located at the same coastal site. Dewatering and materials transfer also occur at the coastal site. Minor residuals are disposed at inland landfill (not shown).

The "J" Family of Candidate Options call for the **composting** of a portion of the sludge **at an island site**, with **combustion** of the balance **at a coastal processing site**. In both cases, sludge would be processed as a raw material without prior digestion on Deer Island. Because the sludge would not be digested, transport of the sludge to the processing location would be restricted to pipeline. Four site/technology combinations are possible and are illustrated on Figure 3-5. Brief descriptions of these candidate options follow:

- o J5-01 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported as a liquid from Deer Island to the **Quincy Shipyard** by pipeline for dewatering and combustion. The composted sludge would be transported by truck on ferry to the shipyard for distribution to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o J5-02 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported as a liquid from Deer Island to the **Lynn South Harbor** site by pipeline for dewatering and combustion. the composted sludge would be transported by truck on ferry to the Lynn site for distribution to various sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.
- o J5-03 - Raw primary sludge would be transported as a liquid by pipeline from Deer Island to **Spectacle Island** for dewatering and composting. Raw secondary sludge would be transported as a liquid by pipeline from Deer Island to the **Quincy Shipyard** for dewatering and combustion. Compost would be brought to the shipyard by truck on ferry for distribution to various inland sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

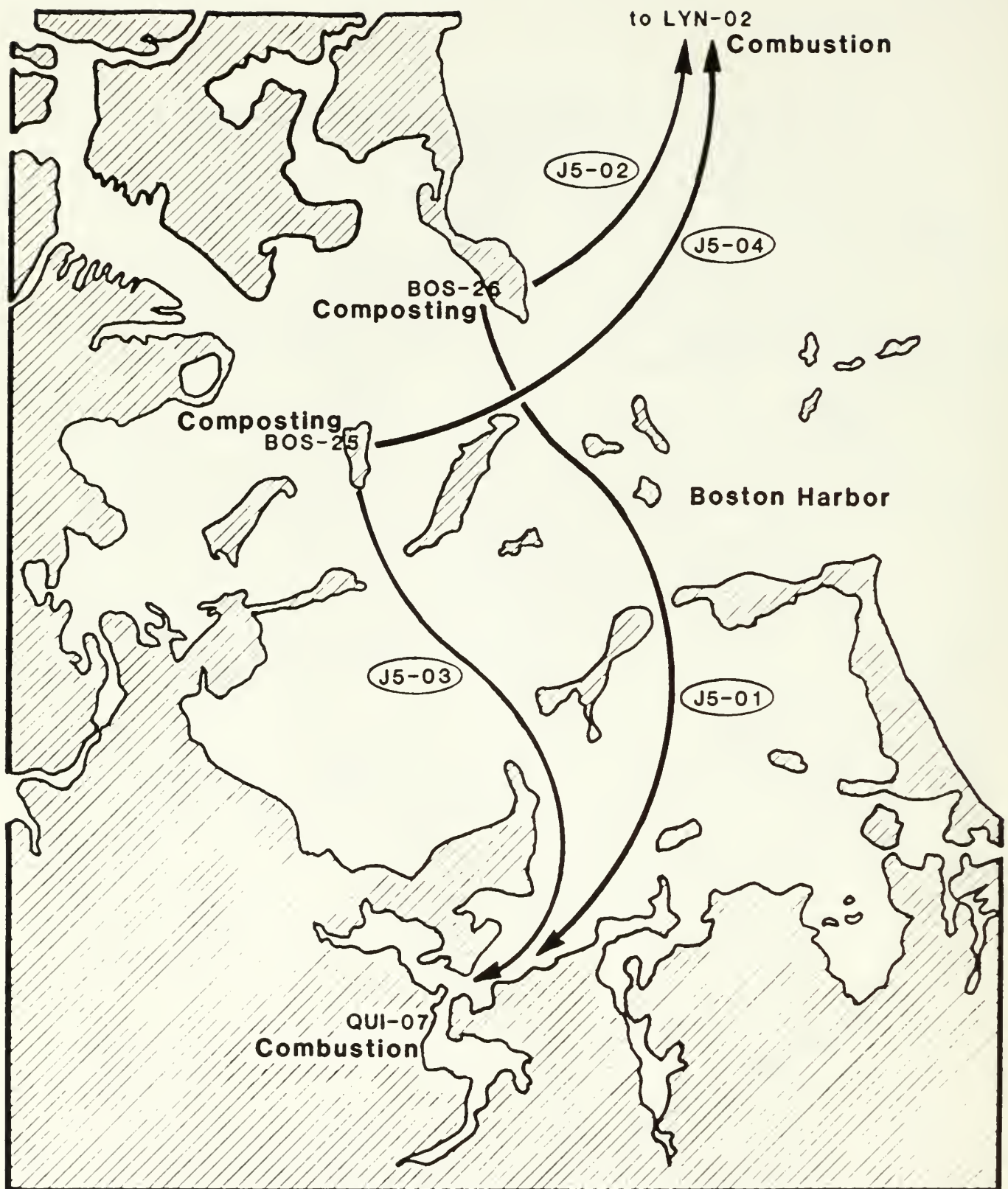


Figure 3-5
The "J" Family of Candidate Options

Island site is used for dewatering and composting. Coastal site is used for dewatering, combustion, and materials transfer. Minor residuals are disposed at inland landfill (not shown).

- o J5-04 - Raw primary sludge would be transported as a liquid by pipeline from Deer Island to **Spectacle Island** for dewatering and composting. Raw secondary sludge would be transported as a liquid by pipeline from Deer Island to the **Lynn South Harbor** site for dewatering and combustion. Compost would be brought to the Lynn site by truck on ferry for distribution to various inland sites for beneficial uses. Ash from the combustion process would be trucked to the minor residuals landfill for ultimate disposal.

The "I" Family of Candidate Options call for the combustion of a portion of the sludge at an island site, with composting of the balance of sludge at an inland processing site. A coastal site would be used only for dewatering and transfer. Six site/technology combinations are possible under this scenario, which are illustrated on Figure 3-6. A brief description of these candidate options follows:

- o I7-01 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer inland to the **Walpole** processing site for composting. Composted sludge would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported from Deer Island to the Quincy Shipyard, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.
- o I7-02 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and transfer inland to the **Stoughton** processing site for composting. Composted sludge would be distributed to various sites for

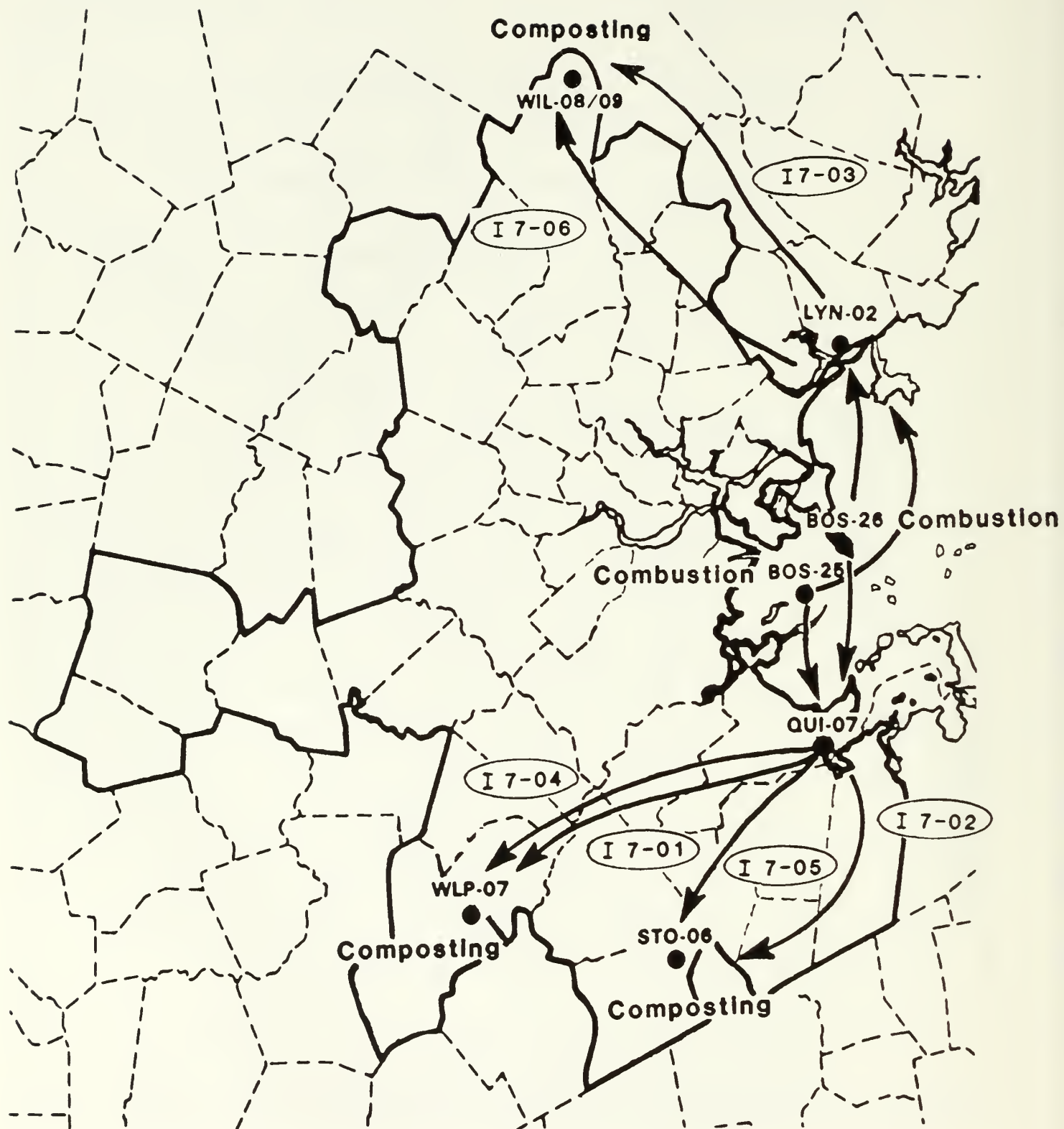


Figure 3-6

The "I" Family of Candidate Options

Island site is used for dewatering and combustion. Composting is located at an inland processing site. Coastal site is used for dewatering and materials transfer. Minor residuals are disposed at inland landfill (not shown).

beneficial uses. Ash from the combustion process would be transported from Deer Island to the Quincy Shipyard, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.

- o I7-03 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and transfer inland to the **Wilmington** processing site for composting. Composted sludge would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported from Deer Island to the Lynn site, via truck on ferry, for transport to the minor residuals landfill for ultimate disposal.
- o I7-04 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. Dewatered sludge would be transferred onto truck or rail for transport to the **Walpole** site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Quincy shipyard for transport to the minor residuals landfill for ultimate disposal.
- o I7-05 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering. Dewatered sludge

would be transferred onto truck for transport to the **Stoughton** site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.

- o I7-06 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering. Dewatered sludge would be transferred onto truck for transport to the **Wilmington** site for composting. Compost would be distributed to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Spectacle Island to the Lynn site for transport to the minor residuals landfill for ultimate disposal.

The "H" Family of Candidate Options call for the combustion of a portion of the sludge (raw) at an island site, with the balance of the sludge (either raw or digested) to be composted at a coastal processing site. Four site/technology combinations are possible under this scenario and are illustrated on Figure 3-7. Brief descriptions of these candidate options follow:

- o H7-01 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and composting. Composted sludge would be distributed from the shipyard to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Deer Island to the shipyard for transfer inland to the minor

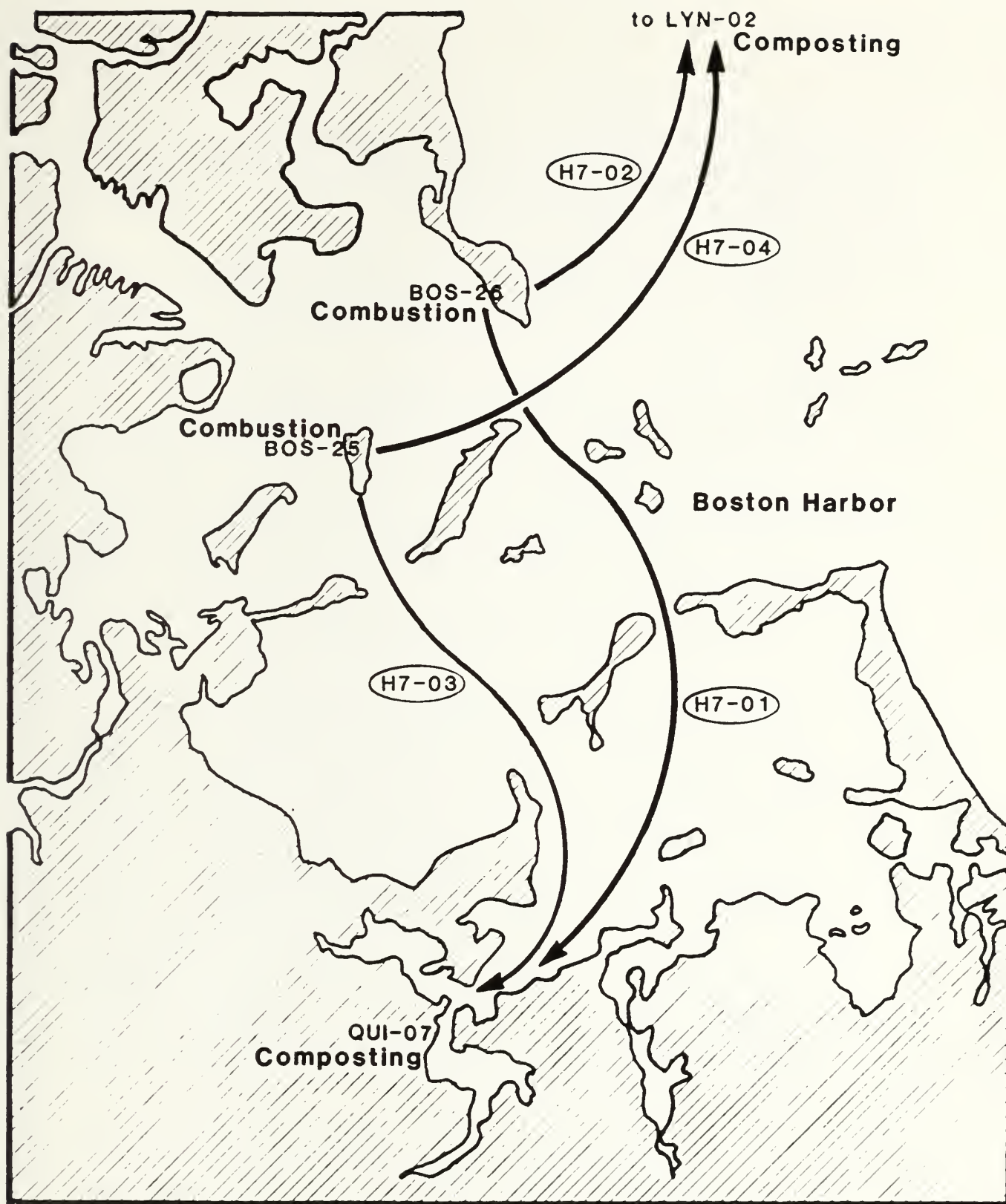


Figure 3-7
The "H" Family of Candidate Options

Island site is used for dewatering and combustion. Coastal site is used to accommodate dewatering, composting, and materials transfer. Minor residuals are disposed at inland landfill (not shown).

residuals landfill for ultimate disposal. In sub-option H5-01, primary sludge would be pipelined to the shipyard as a raw material and composted.

- o H7-02 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and composting. Composted sludge would be distributed from the Lynn site to various sites for beneficial uses. Ash from the combustion process would be transported by truck on ferry from Deer Island to the Lynn site for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-02, primary sludge would be pipelined to the Lynn site as a raw material and composted.
- o H7-03 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Quincy Shipyard**, either by barge or pipeline, for dewatering and composting. Compost would be distributed from the shipyard to various sites for beneficial uses. Ash from sludge combustion would be transported by truck on ferry from Spectacle Island to the shipyard for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-03, primary sludge would be pipelined as a raw material to the shipyard and composted.
- o H7-04 - Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. Primary sludge would be digested and transported from Deer Island to the **Lynn South Harbor** site, either by barge or pipeline, for dewatering and composting. Compost would be distributed from the Lynn site to various

sites for beneficial uses. Ash from sludge combustion would be transported by truck on ferry from Spectacle Island to the Lynn site for transfer inland to the minor residuals landfill for ultimate disposal. In sub-option H5-04, primary sludge would be pipelined to the Lynn site as a raw material and composted.

The "G" Family of Candidate Options call for both **combustion and composting** of sludge **at island sites**, with the technologies located either at a single island site, in the case of Spectacle Island, or divided between the two. Six site/technology combinations are possible under this management scenario and are illustrated on Figures 3-8 through 3-10. Brief descriptions of these candidate options follow:

- o G5-01 - Raw sludge would be transported by pipeline to **Spectacle Island** for dewatering and processing. Raw primary sludge would be composted, raw secondary sludge would be combusted. Compost would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for distribution to various sites for beneficial uses. Ash from the combustion process would be transported from Spectacle Island to the shipyard for transport to the minor residuals landfill for ultimate disposal.
- o G5-02 - Raw sludge would be transported by pipeline to **Spectacle Island** for dewatering and processing. Raw primary sludge would be composted, raw secondary sludge would be combusted. Compost would be transported by truck on ferry from Spectacle Island to the **Lynn South Harbor** site for distribution to various sites for beneficial uses. Ash from the combustion process would be transported from Spectacle Island to the Lynn site for transport to the minor residuals landfill for ultimate disposal.

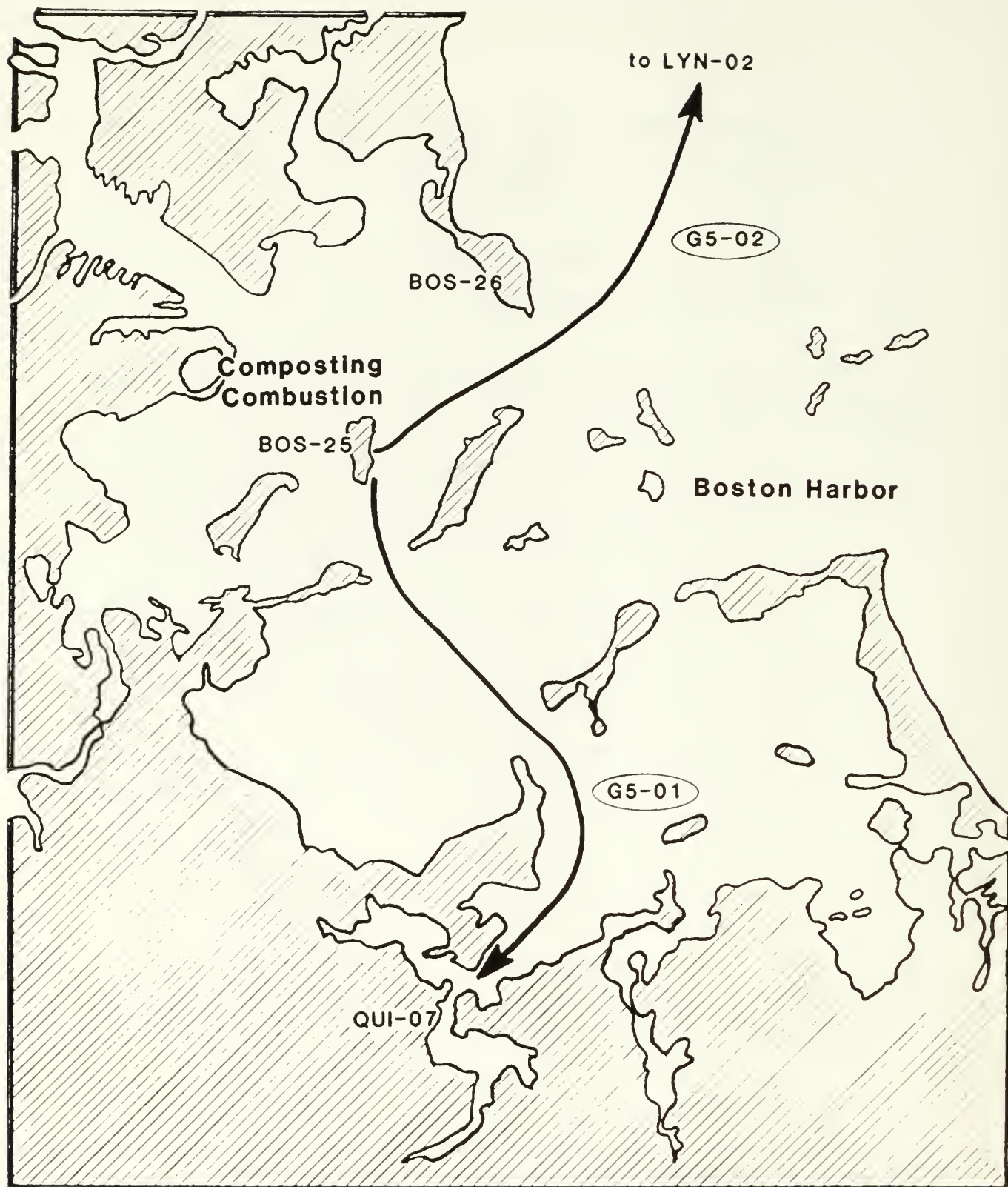


Figure 3-8

The "G" Family of Candidate Options (1 of 3)

One island site (Spectacle) is used to accommodate dewatering, composting, and combustion. Coastal site is used for materials transfer only. Minor residuals are disposed at inland landfill (not shown).

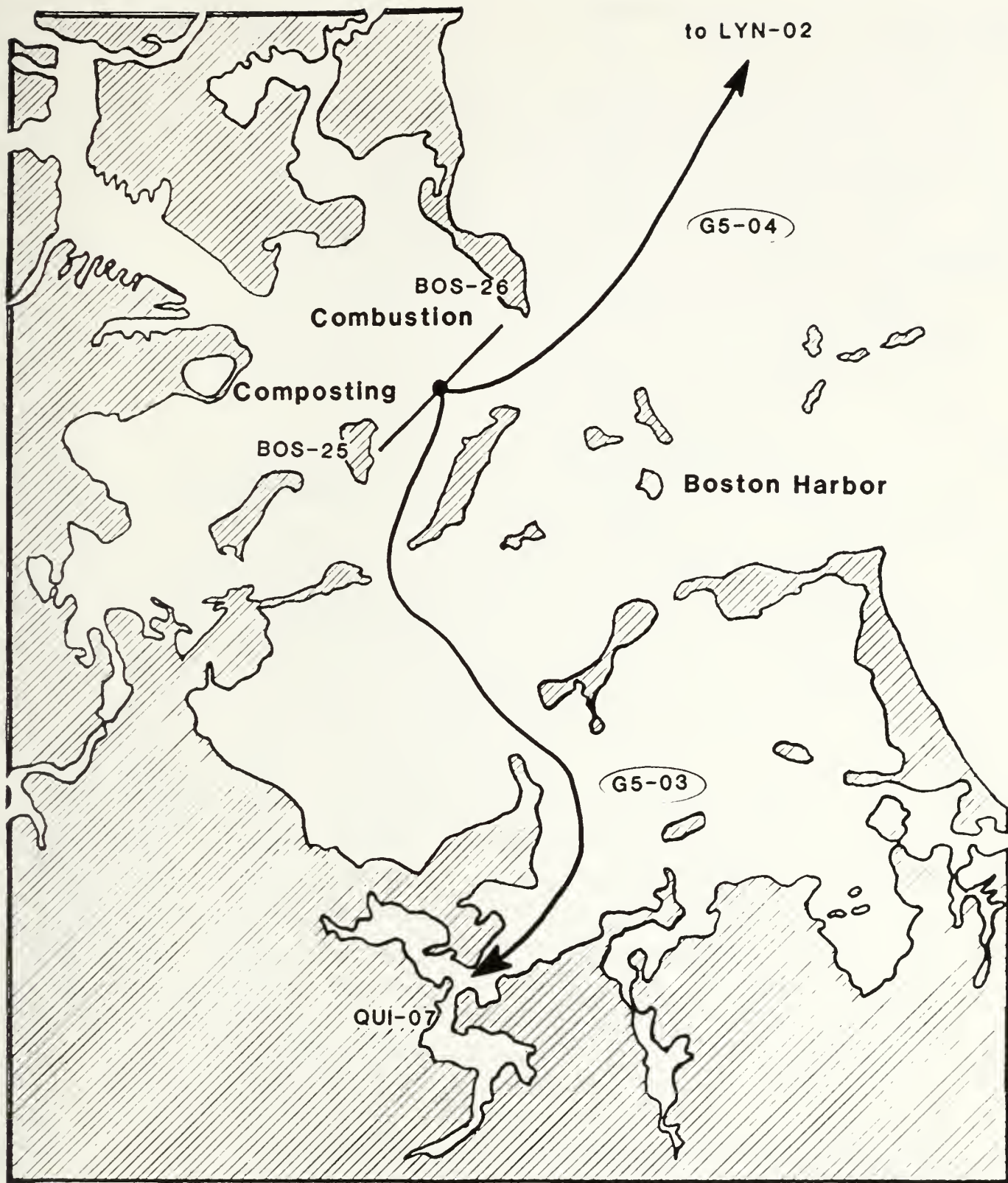


Figure 3-9

The "G" Family of Candidate Options (2 of 3)

Two island sites are used to accommodate dewatering, combustion (Deer), and composting (Spectacle). Coastal site is used for materials transfer only. Minor residuals are disposed at inland landfill (not shown).

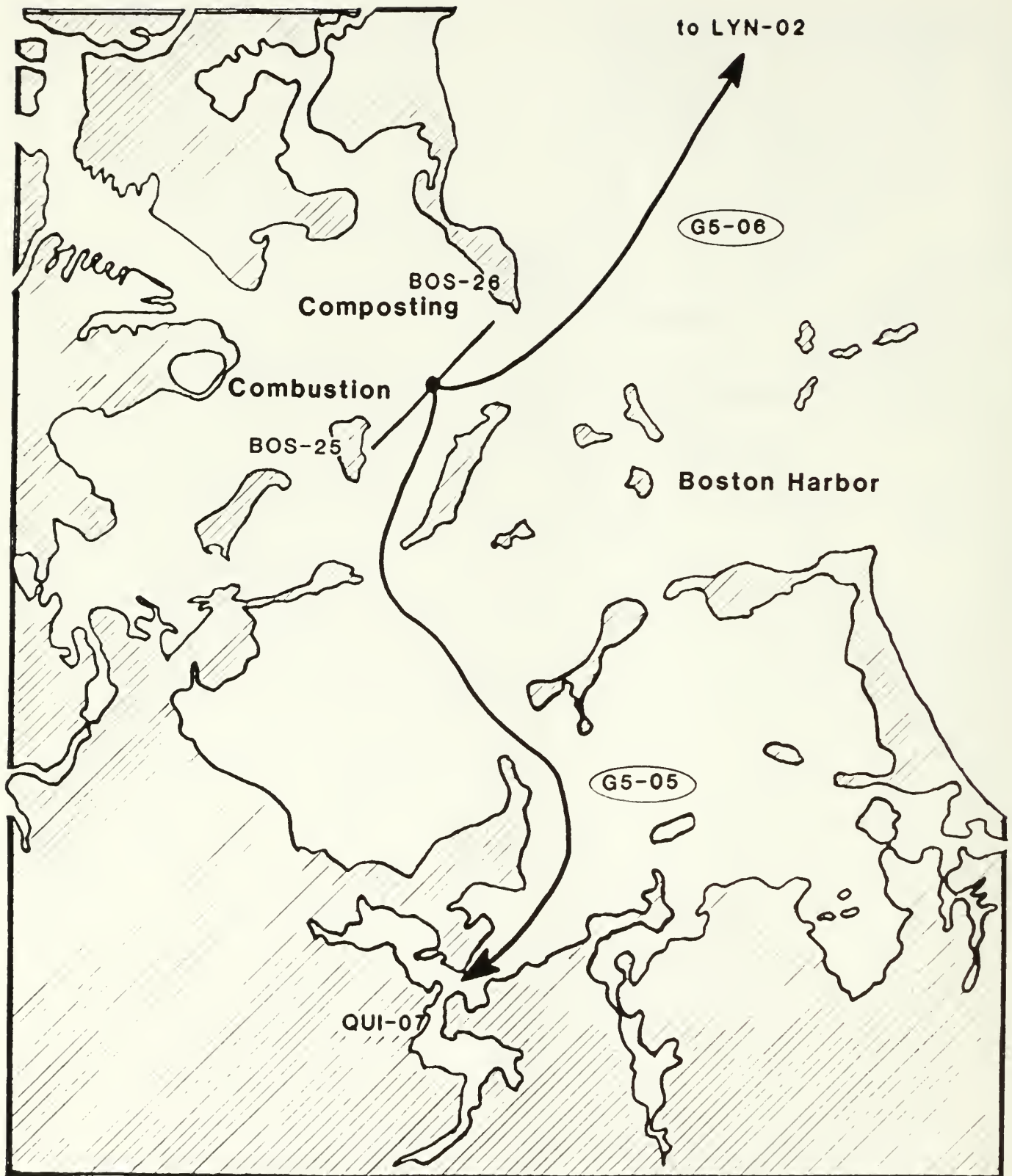


Figure 3-10

The "G" Family of Candidate Options (3 of 3)

Two island sites are used to accommodate dewatering, combustion (Spectacle), and composting (Deer). Coastal site is used for materials transfer only. Minor residuals are disposed at inland landfill (not shown).

- o G5-03 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Raw primary sludge would be transported by pipeline from Deer Island to **Spectacle Island**, for dewatering and composting. Compost would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for distribution to various sites for beneficial uses. Combustion ash would be transported from Deer Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.
- o G5-04 - Raw secondary sludge would be dewatered and combusted on **Deer Island**. Raw primary sludge would be transported by pipeline from Deer Island to **Spectacle Island**, for dewatering and composting. Compost would be transported by truck on ferry from Spectacle Island to the **Lynn South Harbor** site for distribution to various sites for beneficial uses. Combustion ash would be transported from Deer Island to the Quincy Shipyard for transport to the minor residuals landfill for ultimate disposal.
- o G5-05 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. The combustion ash would be transported by truck on ferry from Spectacle Island to the **Quincy Shipyard** for transport to the minor residuals landfill for ultimate disposal. Compost would be transported from Deer Island to the shipyard for distribution to various sites for beneficial uses.
- o G5-06 - Raw primary sludge would be dewatered and composted on **Deer Island**. Raw secondary sludge would be transported by pipeline from Deer Island to **Spectacle Island** for dewatering and combustion. The combustion ash would be transported

by truck on ferry from Spectacle Island to the Lynn South Harbor site for transport to the minor residuals landfill for ultimate disposal. Compost would be transported from Deer Island to the Lynn site for distribution to various sites for beneficial uses.

Appendix A
Technology-Specific Ordered Site Lists

Tier 2 Screening Table Legend

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE	
SITE RANK	NUMBER											1 RAW	WGT	ACRES	ACRES		QUADRANGLE	CODE	STATUS	LAND	USE	ORIGIN

1	2		3				4	5	6	7	8		9	10	11	12	13	14
---	---	--	---	--	--	--	---	---	---	---	---	--	---	----	----	----	----	----

Column	Title	Description
1	Tier 1 Site Rank	This is the ranking of the site based on weighted score shown in column 5. The weighted score reflects the relative importance of the screening criteria to site development but is independent of any consideration of technology.
2	Site Number	This is the unique identification code assigned to the site. It is composed of a three letter abbreviation of the town or city in which the site is located followed by a two digit number.
3	Screening Criteria Scores	<p>Sites were evaluated and scored for each of the criteria shown in Table 3-1. The numbers in this column are the scores that were given for each criterion. Criteria are abbreviated as follows:</p> <p>ENG - Engineering Considerations NOI - Noise Environment LAN - Land Use CUL - Cultural Resources TRA - Transportation/Traffic SUR - Surface Water GRO - Ground Water WET - Wetlands ECO - Ecology AIR - Air Quality/Odors</p>
4	Raw Score	This number is the result of adding the ten scores listed in item 3 above.
5	Weighted Score	Some criteria are more important than others to site development. Ten weighting factors reflecting the relative importance of the criteria were developed and applied to the scores in column 3. The score shown here is the result of applying these weighting factors and is the basis for the ordering of the sites (Column 1).
6	Total Acres	This is the total contiguous acreage of the site as measured from a topographic map.

2863F PE311-302

TIER 2 SCREENING TABLE LEGEND (Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK NUMBER												I RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGIN

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Column	Title	Description
7	Net Acres	Net acres reflects the site acreage available for development after subtracting wetland areas, areas with excessive slopes, and developed portions of the site.
8	Name	If there is a common name associated with the site it has been indicated. Not all sites have such names.
9	USGS Quadrangle	This identifies the 7.5 minute United States Geographic Survey topographic map that contains the site.
10	Owner Code	A P indicates that the majority of the site is publically owned; a C indicates that the majority of the ownership is private.
11	Location	The code I indicates an inland site in the MWRA service area; C is the designation of a coastal site and X signifies an island.
12	Avail Status	This code indicates the development status of the site. A signifies that 0 to 25 percent of the site is in use or under development; B means that 26 to 50 percent of the site is in use or under development; C means that 51 to 75 percent is in use while D indicates that between 76 and 100 percent of the site is actively being used. This was determined through field investigations. Where site access was restricted no estimates were made of the extent of development.
13	On Site Land Use	These codes indicate whether the site is vacant, designated as part or conservation land, or if used, the status of this use. Specifically the codes signify the following: A-1 = State Park A-2 = Town Park and/or Designated Conservation Land

2863F PE311-302

TIER 2 SCREENING TABLE LEGEND (Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE	
SITE RANK	NUMBER											I RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGIN	
1	2			3								4	5	6	7	8	9	10	11	12	13	14

Column	Title	Description
		B-1 = Existing, Developed Site Use (on-going) and/or New Development Under Construction
		B-2 = Low Intensity Use (i.e. - quarry, park-ride, warehouse, etc.)
		B-3 = Abandoned Existing Land-Use (i.e. - abandoned warehouse)
		C-1 = Vacant Land.
14	Site Origination	Sites identified during the Phase I study are noted by the code SEA with the number in parentheses indicating the ranking of the site in that study. Sites identified during the Phase II study are coded ERT. A CEM code refers to additional sites from a CE Magure site inventory report dated May 1986.

INITIAL COASTAL COMPOSTING AND COMBUSTION SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NO1	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE RAW WGT	TOTAL ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGINATION
19	QUI-07	5	6	8	8	7	4	7	9	10	6	170	244	150	150 Onco ShYd WEYMOUTH		C	C	A	B-3	SEA
41	BOS-23	4	9	7	4	7	5	7	6	8	6	163	234	50	40 Nepst Res BOSTON SOUTH		P	C	A	A-1	SEA (224)
37	BOS-25	5	9	9.5	2	1	5	9	6	6	9	161.5	233	77	77 Spectl Is HULL		P	X	A	B-3	ERT
39	LYN-02	4	9	8	10	6	4	6	2	10	7	166	232	87	48 Lynn Harb LYNN		C	C	C	B-3	CEM
36	BOS-26	7	5	5	10	3	5	10	4	7	9	165	213	179	25 Deer Is HULL		P	X	A	B-2	ERT
88	SOM-02	4	9	2	3	6	4	6	10	7	7	158	209	108	108 Mystic Res BOSTON NORTH		P	C		A-1	SEA (280)
72	QUI-09	3	6	5	10	2	6	9	6	7	8	162	202	50	35 Moon Is HULL		P	X	C	E-3	ERT
151	HUL-01	5	5	5.5	0	1	4	9	4	7	9	149.5	188	212	179 Pdots Is HULL		P	X	A	C-1	ERT
191	BOS-28	3	8	4	0	2	4	7	2	4	10	144	183	143	109 Tmpson Is BOSTON SOUTH		C	X		B-2	ERT
139	BOS-27	6	4	5.5	6	1	4	9	2	6	9	152.5	182	35	27 Lovell Is HULL		P	X	D	A-1	ERT
178	BOS-24	5	3	3	2	2	5	9	4	5	9	147	173	183	146 Long Is HULL		P	X		C-1	ERT

OWNERSHIP CODE:

P = PUBLIC

C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%

B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park

A-2 = Town Park and/or Designated Conservation Land

B-1 = Existing, Developed Site Use (on going) and/or

New Development Under Construction

B-2 = Low Intensity Existing Site Use

(i.e. - quarry, park-ride, warehouses, drive-in theaters)

B-3 = Abandoned, Existing Land Use

(i.e. - abandoned warehouse)

C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank

SEA (number) = SEA Site bank and SEA

SEA = SEA Site bank, no number
designation

CEM = CEM Site Bank

LOCATION

I = Inland

C = Coastal

X = Island

INITIAL INLAND COMPOSTING AND COMBUSTION SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE I	TOTAL RAW WGT	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGIN/NOTES
3	WIL-08	5	8	10	8	5	6	8	6	7	10	73	271	79	39	WILMINGTON	C	I	C	B-3	SEA (111)
13	WIL-09	7	7	5	8	5	6	10	4	8	10	70	244	118	46	WILMINGTON	C	I	C	C-1	SEA (503)
28	STO-06	4	5	8.5	8	5	5	10	4	7	8	164.5	232	187	90	BLUE HILLS	C	I	B	C-1	SEA (79)
16	WLP-07	6	5	5.5	7	3	7	10	10	9	8	170.5	232	46	39	NORWOOD	C	I	A	C-1	SEA (85)
23	ASH-22	6	6	3	3	4	6	10	10	8	9.5	165.5	230	125	125	HOLLISTON	C	I	A	C-1	SEA (523)
35	WES-02	5	7	6	7	6	6	8	4	7	8	64	230	131	111	NORWOOD	C	I	A	C-1	SEA (95)
33	BUR-03	6	7	8	7	4	5	8	4	8	8	65	230	259	102	LEXINGTON	C	I	A	C-1	SEA (24)
76	WLP-14	4	6	8	6	6	4	7	0	6	10	57	229	616	90	WRENTHAM	C	I	A	C-1	SEA (89)
30	HLB-13	7	4	5	5	5	6	10	4	8	9.5	163.5	228	291	240	MEDFIELD	C	I	B	C-1	SEA (509)
27	HLB-11	9	5	5	5	4	5	10	4	7	10	64	227	108	93	WEYMOUTH	C	I	A	C-1	SEA (515)
34	CAN-14	4	6	9	8	3	6	10	4	6	8	64	226	79	42	BLUE HILLS	P	I	A	C-1	SEA (31)
47	FRA-12	6	9	9	6	5	2	6	4	8	6	63	226	82	56	FRAMINGHAM	C	I	A	C-1	SEA (46)
78	WIL-07	6	7	7	8	6	5	4	0	8	9	60	224	152	53	WILMINGTON	C	I		C-1	SEA (109)
83	NOR-03	4	5	8	0	4	5	6	8	8	8	56	222	50	46	NORWOOD	C	I		C-1	SEA (535)
54	WES-01	4	4	6	10	8	8	3	10	7	5	65	222	88	88	NORWOOD	C	I	D	C-1	SEA (56)
80	BUR-02	1	6	8	6	6	6	10	2	3	8	56	221	65	49	LEXINGTON	C	I		C-1	SEA (26)
26	ASH-20	8	5	5	7	4	8	10	4	7	8	66	221	187	182	FRAMINGHAM	C	I	A	A-2	SEA (544)
65	WOB-08	4	10	6	10	6	6	8	2	0	8	60	220	132	68	WILMINGTON	C	I	D	B-3	SEA (116)
67	HLB-10	7	3	7	6	5	5	4	8	8	8	61	220	105	33	BLUE HILLS	C	I	A	C-1	SEA (61)
73	WEY-09	7	7	6	6	4	7	3	4	10	8	62	216	56	31	WEYMOUTH	C	I	B	B-2	SEA (102)
59	WEY-15	4	8	4	6	5	8	7	4	7	8	63	218	1410	50 Wym ArStr	P	I	D	B-2	SEA (293)	
49	HLB-13	7	6	4	4	3	6	10	4	7	10	61	217	343	254	WEYMOUTH	C	I	A	C-1	SEA (514)
90	STO-05	2	6	9	6	4	8	10	0	2	8	55	214	382	90	BLUE HILLS	C	I	B	C-1	SEA (526)
92	LEX-02	6	8	9	9	5	6	4	0	7	6	60	213	76	43	CONCORD	C	I		C-1	SEA (66)
84	WEY-13	3	9	5	4	4	7	8	2	8	8	58	213	130	93	WEYMOUTH	C	I		B-2	SEA (105)
56	WLP-06	6	2	4	5	4	6	10	4	7	10	60	212	105	93 MCI Walpi	P	I	A	C-1	SEA (282)	
46	NOR-04	6	3	5	6	5	6	10	8	8	6	63	209	75	50	NORWOOD	C	I	B	C-1	SEA (536)
95	STO-08	7	5	4.5	1	6	5	10	2	3	9	152.5	209	534	382	BROCKTON		I		B-2	SEA (521)
61	LEX-10	5.5	3.5	4	8	4.5	3	10	7	7.5	8.5	161.5	208	84	54	CONCORD	C	I	B	A-2	ERT
81	NAT-08	6	3	4	2	4	5	10	6	6	9.5	155.5	207	113	61	NATICK	C	I	B	C-1	SEA (508)
128	HLB-12	6	7	5	3	6	4	2	8	8	8	53	205	139	109	BROCKTON	C	I	A	B-2	SEA (62)
108	ASH-18	5	4	5	0	6	6	8	4	8	7	53	205	130	126	FRAMINGHAM	C	I	A	C-1	SEA (7)
52	BED-09	7	4	3	8	2	6	10	4	9	10	63	204	124	96 Spring St	P	I	A	C-1	SEA (214)	
60	MAL-01	4	8	4	7	4	7	10	5	10	5	64	203	47	42 RoweGury	C	I	D	B-2	ERT	
93	REV-07	5	7	3.5	4	5	2.5	6	6	10	7	58	203	32	31	LYNN		I		B-2	ERT
82	WOB-11	3	5	5	10	4	7	8	4	7	7.5	160.5	202	89	75	WILMINGTON		I		B-2	ERT
89	NAT-06	6	4	5	6	5	6	8	4	7	7	58	202	65	57	NATICK	C	I	A	C-1	SEA (507)
117	WEY-12	6	5	6	6	4	6	6	0	8	8	55	198	89	32	WEYMOUTH	C	I		B-2	SEA (97)
101	STO-04	4	3	4	2	4	5	10	6	8	8	54	197	114	86	BLUE HILLS	C	I	A	B-2	SEA (525)
133	BED-10	6	5	3	2	4	6	6	4	5	10	51	197	183	151	CONCORD	C	I		C-1	SEA (502)
123	WLP-11	7	4	5	2	4	5	6	4	8	8	53	196	103	89	NORWOOD	C	I		C-1	SEA (94)
48	STN-02	6	4	2	10	3	6	10	10	8.5	6.5	66	195	35	35 BearHl GC		I	D	B-2	ERT	
100	NAT-07	8	3	4	4	3	6	8	4	6	9	55	194	224	222	NATICK	C	I	A	B-2	SEA (524)
79	WOB-10	6	5	4	8	3	6	10	4	7.5	7	160.5	194	169	125 Whisphill		I		C-1	ERT	
175	WLP-10	4	4	6	2	4	5	4	2	8	9	48	194	124	53	MEDFIELD	C	I		C-1	SEA (68)
102	WLP-15	8	2	4	5	2	6	7.5	4	7	10	155.5	193	589	504	MEDFIELD	C	I		C-1	SEA (510)
99	NAT-05	7	3	3	4	2	6	10	4	6	10	55	192	74	72	NATICK	C	I	A	B-2	SEA (506)
113	CAN-17	2	6	5	6	2	6	10	2	8	8	55	191	445	195	BLUE HILLS	P	I	B	C-1	SEA (545)
110	MED-02	7	3	4.5	2	4	7	7	8	6	6	154.5	191	117	117	NATICK	C	I	A	C-1	SEA (505)
70	STN-01	5.5	3.5	3	9	3	6	10	8.5	8.5	6	63	190	81	46 GolfCours		I	D	B-2	ERT	
136	NOR-02	6	3	5	3	6	8	6	4	7	5	53	189	128	86	NORWOOD	C	I		B-2	SEA (72)
146	RED-03	5	6	4	6	4	5	6	2	7	8	53	189	172	98 Camp CrtGu	P	I		B-2	SEA (274)	
114	LEX-09	5.5	6.5	2	2	4.5	3	10	6	7	7	153.5	189	32	32 FiskeHill		I		A-1	ERT	
149	FRA-16	4	5	3	4	5	5	6	4	10	7	53	188	171	74 MCI Frmh	P	I		B-2	SEA (249)	
132	ASH-10	4	5	6	6	4	3	8	4	8	6	54	188	65	59	FRAMINGHAM	C	I		B-2	SEA (5)

INITIAL INLAND COMPOSTING AND COMBUSTION
SITE SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER											RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION
112	BRN-13	6	6	5	6	2	3	10	2	7	8	55	187	145	63	WEYMOUTH	C	I		C-1	SEA (517)
94	WLF-12	9	2	5	7	2	5	10	2	8	8	58	187	212	200	NORWOOD	C	I		C-1	SEA (534)
104	CAN-12	5	6	0	4	3	7	10	6	5	9	55	187	123	123	BLUE HILLS	P	I	A	B-2	SEA (531)
156	WIL-10	6	1	5	4	5	6	6	4	7	7	51	185	110	94	WILMINGTON	C	I		C-1	SEA (504)
107	HLE-09	8	3	4	4	2	5	10	4	7	8	55	185	50	33	BLUE HILLS	C	I	B	C-1	SEA (529)
153	STD-07	7	5	3	2	4	5	7	5	4	8	50	185	204	138	BROCKTON		I		A-2	SEA (522)
125	LEX-04	8	4	3.5	8	6	6	7	0	7	6	155.5	164	225	151	LEXINGTON	C	I		B-2	SEA (501)
134	DED-03	5	6	3	1	5	6	10	4	7	5	52	183	149	60	NEWTON	C	I	A	C-1	SEA (41)
143	WES-04	5	4	4	6	4	4	10	0	7	8	52	183	322	43	NORWOOD	C	I		C-1	SEA (546)
165	NED-07	5	2	3	0	4.5	6	10	4	3	8.5	46	181	160	116	NATICK		I		A-2	ERT
155	BRN-12	8	4	5	4	3	2	6	6	7	7	52	181	206	90	BLUE HILLS	C	I	A	C-1	SEA (530)
144	STD-03	8	3	3	0	3	6	10	2	7	8	50	180	48	34	BLUE HILLS	C	I		C-1	SEA (524)
124	BOS-21	6	4	2	8	5	7	7	2	10	6	57	180	150	110	Bs St hsp BOSTON SOUTH	F	I		E-3	SEA (222)
140	BEL-07	5	2	1	7	5	5.5	7	5	8.5	8	54	180	107	82	BelmontCC LEXINGTON		I		B-2	ERT
163	CAN-16	8	5	3	4	5	5	4	5	7	6	52	179	186	153	BLUE HILLS		I	A	C-1	SEA (220)
171	NOR-05	7	3	7	6	4	4	6	0	8	6	51	179	159	41	NORWOOD	C	I		C-1	SEA (70)
129	MEL-06	7	3	3	7	3	4	6	7	9	7	56	179	58	88	GolfCours BOSTON NORTH		I		B-2	ERT
162	MIL-01	7	3	2	4	5	4	7	4	6	8	50	178	449	302	BLUE HILLS	P	I		A-1	SEA (533)
118	WES-03	7	2	3	6	2	5	10	4	8	8	55	177	126	45	NORWOOD	C	I		C-1	SEA (538)
183	MIL-03	3	7	0	0	6	5	8	6	4	7	46	177	4200	3112	BHIs Res BLUE HILLS	P	I		A-1	SEA (265)
158	ASH-15	8	4	2	4	2	3	7	4	8	9.5	151.5	177	114	109	HOLLISTON	C	I		C-1	SEA (519)
182	WEY-14	5	2	2	2	4	7	5	6	7	8	46	175	120	71	WEYMOUTH	C	I		C-1	SEA (518)
170	RED-02	5	2	4	7	3	8	6	2	6	8	51	175	75	60	READING	C	I		C-1	SEA (513)
137	WOR-09	7	2	3	4	2	6	10	3	7.5	8	152.5	175	60	39	LEXINGTON		I		C-1	ERT
157	ASH-03	7	4	2	5	4	4	7	6	6	7	52	175	50	37	Aikens Rd MARLBOROUGH	P	I		C-1	SEA (203)
164	ASH-12	8	4	2	8	3	6	3	4	8	8	54	174	50	42	HOLLISTON	C	I		C-1	SEA (520)
187	BED-06	7	7	3	2	3	5	8	0	3	8	46	172	53	31	CONCORD		I		C-1	SEA (215)
150	BEL-06	5	3	2	4	3	5.5	10	5	8.5	6.5	152.5	171	205	53	McLenHosp LEXINGTON		I		A-2	ERT
142	MEL-04	3	3.5	3	5	2	5	10	4	8.5	7	55	171	169	137	MtHoodMP BOSTON NORTH		I		A-2	ERT
130	BEL-04	6.5	2	1	6	3	7	8	7	8.5	6.5	155.5	171	89	30	WellngtH LEXINGTON		I		C-1	ERT
205	NED-05	4.5	5	5	1	2	4.5	7	0	5.5	8.5	43	170	272	55	NATICK		I		E-3	ERT
199	WIL-06	1	5	6	8	6	6	6	2	3	4	47	169	63	55	WILMINGTON	C	I		B-2	SEA (116)
196	WEY-16	3	2	2	0	4	6	8	4	7	8	44	169	82	50	WEYMOUTH	C	I		C-1	ERT
148	LEX-06	5	3	2	7	2	6	10	5	5.5	7.5	53	168	97	85	WhpHill LEXINGTON		I		A-2	ERT
184	CAN-20	5	6	3	8	5	5	7	3	1	6	45	168	213	193	BLUE HILLS	P	I	A	C-1	ERT
194	STD-02	6	4	7	7	3	5	4	2	6	5	45	167	44	33	NORWOOD	C	I		C-1	SEA (60)
176	BRO-01	5	3	2	3	2	6.5	7	7	7.5	7	50	167	65	40	NEWTON		I	B	C-1	ERT
131	WAT-02	5	3	0	4	2	7.5	10	10	7	6	154.5	166	84	48	OakleyCC NEWTON		I	B	B-2	ERT
160	BRO-02	5.5	3	2	5	2	7	7	8	7.5	6	53	166	110	118	PthwMdwCC NEWTON		I	A	E-2	ERT
169	BRO-03	6	2.5	1	3	2	7	7	8	7.5	7	51	165	134	123	TheCntrC NEWTON		I	A	E-2	ERT
217	RAN-03	6.5	2	5	1	4	4	4	0	8.5	7	42	163	162	48	BLUE HILLS		I		C-1	ERT
180	MIL-02	5	2	2	4	3	5	7	8	8	6	150	163	306	200	BLUE HILLS	C	I	A	C-1	SEA (532)
166	NEW-04	5	3	1	6	3	7	10	4	4.5	7	150.5	163	189	160	ChrIRvCC NEWTON		I	A	E-2	ERT
197	NED-06	7	3	1.5	1	2	5.5	7	2	7	9	45	162	79	51	NATICK		I		C-1	ERT
201	NOR-07	4	8	5	6	4	4	4	5	7	2.5	149.5	161	108	107	NORWOOD		I		E-2	ERT
188	ASH-11	7	4	3	5	2	3	7	4	7	7	49	161	86	31	Howe St MARLBOROUGH	P	I		C-1	SEA (210)
211	BED-08	4	1	3.5	4	4	6	5	2	8	7	144.5	161	96	49	BILLERICA		I		C-1	SEA (217)
195	NED-03	7	1	2	6	4	3	6	6	4.5	7.5	47	160	117	64	NEWTON		I		B-2	ERT
198	BOS-22	5	3	1	1	4	7	7	4	8	6	46	159	268	261	Frank Prk BOSTON SOUTH	P	I		A-1	SEA (223)
161	WNC-01	5	2	1	7	2	3	10	8	8.5	6.5	53	158	139	127	Wchtr CC LEXINGTON		I		B-2	ERT
179	BOS-20	6	2	0	4	3	5	7	8	10	6	51	157	66	38	BkBay Fen BOSTON SOUTH	P	I		A-2	SEA (221)
214	ASH-17	8	5	3	6	3	1	3	5	3	7.5	144.5	156	425	180	Ash St Pk HOLLISTON	P	I		A-1	SEA (206)
222	QUI-08	2	4	3	0	5	5	7	4	5	5	40	156	523	375	BLUE HILLS	C	I		C-1	SEA (73)
235	NED-01	8	6	2	2	7	3	1	0	2	6.5	137.5	154	493	37	NEWTON		I		A-2	SEA (268)
210	WNC-02	3	2	2	2	2	5	9	5	6	7.5	143.5	154	234	45	LEXINGTON		I		C-1	ERT
227	FRA-13	6	4	5	2	2	2	3	4	8	6	42	152	103	54	FRAMINGHAM	C	I		E-2	SEA (49)

INITIAL INLAND COMPOSTING AND COMBUSTION
SITE SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRD	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE	
SITE RANK	NUMBER											RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION	
219	WAK-04	5.5	2	2	2	3	2	9	0	5	9	139.5	151	128	62	READING		I		C-1	ERT	
213	WLT-11	3	1	3	3	2	6.5	5	9	7.5	5	1	45	148	74	74	LEXINGTON		I		C-1	ERT
212	RAN-02	7.5	3	2.5	4	1	5	5	2	8.5	7	145.5	147	66	45	BLUE HILLS		I		C-1	ERT	
228	WLT-06	4.5	6	2	2	6	4	3	9	4	2	142.5	147	163	32	NATICK		I		C-1	SEA (283)	
235	RED-04	6.5	4	3	4.5	3	5	1	0	4.5	7.5	1	39	145	274	153	WILMINGTON		I		E-2	ERT
200	MEL-05	6	1	2	5	1	5	10	2	6.5	6.5	1	47	144	65	51 PrBrkPrk	BOSTON NORTH		I		A-2	ERT
237	FRA-01	6	5	2	1	6	1	0	7.5	4	4.5	1	37	143	940	45 CochStPk	FRAMINGHAM	P	I		A-1	SEA (244)
226	ASH-23	6	3	1	1	4	0	10	4	2	7	1	38	143	646	375 Ind Brook	MARLBOROUGH	P	I		A-1	SEA (204)
224	LEX-05	5	1	1	5	3	6	5	2	8	7	1	43	142	107	63	LEXINGTON		I		C-1	ERT
229	MED-07	3	3	0	6	7	0	10	4	0	6	1	39	142	3158	2233 MdIsx Res	BOSTON NORTH	P	I		A-1	SEA (255)
225	BEL-05	8	4	2	3	2	4	6	0	4.5	7	140.5	140	82	55	LEXINGTON		I		A-2	ERT	
232	WAK-03	3	3	1	1	4	5	7	4	6	5	1	39	139	598	506 Brkht Rs	BOSTON NORTH	P	I		A-1	SEA (281)
234	WLT-05	5.5	3	1	0	2	5.5	5	6	7	4	1	39	127	132	105	LEXINGTON		I		A-2	ERT
236	MEL-02	7	2	0	3	3	5	4	2	7	5.5	138.5	124	125	100	WellslyCC	NATICK		I		E-2	ERT
238	WOB-12	4	2	2	2	3	0	2	5	2	7	1	29	119	460	190	LEXINGTON		I		A-2	ERT

OWNERSHIP CODE:

P = PUBLIC
C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%
B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park
A-2 = Town Park and/or Designated Conservation Land
E-1 = Existing, Developed Site Use (on going) and/or
New Development Under Construction
E-2 = Low Intensity Existing Site Use
(i.e. - quarry, park-ride, warehouses, drive-in theaters)
E-3 = Abandoned, Existing Land Use
(i.e. - abandoned warehouse)
C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank
SEA (number) = SEA Site bank and SEA
designation
CEM = CEM Site Bank

LOCATION

I = Inland
C = Coastal
X = Island

INITIAL INLAND LANDFILL SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGIN
23	ASH-22	6	6	3	3	4	6	10	10	8	9.5	165.5	272	125	125	HOLLISTON	C	I	A	C-1	SEA (523)
26	ASH-20	8	5	5	7	4	8	10	4	7	8	166	265	187	182	FRAMINGHAM	C	I	A	A-2	SEA (544)
30	WLP-13	7	4	5	5	5	6	10	4	8	9.5	163.5	261	291	240	MEDFIELD	C	I	B	C-1	SEA (509)
33	BUR-03	6	7	8	7	4	5	8	4	8	8	165	257	259	102	LEXINGTON	C	I	A	C-1	SEA (24)
35	WES-02	5	7	6	7	6	6	8	4	7	8	164	254	131	111	NORWOOD	C	I	A	C-1	SEA (95)
49	HLB-13	7	6	4	4	3	6	10	4	7	10	161	249	343	254	WEYMOUTH	C	I	A	C-1	SEA (514)
56	WLP-08	8	2	4	5	4	6	10	4	7	10	160	249	105	93 MCI Walpl	WRENTHAM	P	I	A	C-1	SEA (282)
60	MAL-01	4	8	4	7	4	7	10	5	10	5	164	247	47	42 RoweQuary	BOSTON NORTH	C	I	D	B-2	ERT
52	BED-09	7	3	4	8	2	6	10	4	9	10	163	245	124	96 Spring St	BILLERICA	P	I	A	C-1	SEA (214)
79	WOB-10	6	5	4	8	3	6	10	4	7.5	7	160.5	236	169	125 Whisphill	LEXINGTON		I		C-1	ERT
95	STO-08	7	5	4.5	1	6	5	10	2	3	9	152.5	234	534	382	BROCKTON		I		B-2	SEA (521)
110	NED-02	7	3	4.5	2	4	7	7	8	6	6	154.5	233	117	117	NATICK	C	I	A	C-1	SEA (505)
106	ASH-18	5	4	5	0	6	6	8	4	8	7	153	231	130	126	FRAMINGHAM	C	I	A	C-1	SEA (7)
94	WLP-12	9	2	5	7	2	5	10	2	8	8	150	230	212	200	NORWOOD	C	I		C-1	SEA (534)
100	NAT-07	8	3	4	4	3	6	8	4	6	9	155	226	224	222	NATICK	C	I	A	B-2	SEA (504)
104	CAN-12	5	6	0	4	3	7	10	6	5	9	155	224	123	123	BLUE HILLS	P	I	A	B-2	SEA (531)
102	WLP-15	8	2	4	5	2	6	7.5	4	7	10	155.5	223	589	504	MEDFIELD	C	I		C-1	SEA (510)
113	CAN-17	2	6	5	6	2	6	10	2	8	8	155	218	445	195	BLUE HILLS	P	I	B	C-1	SEA (545)
165	NED-07	5	2	3	0	4.5	6	10	4	3	8.5	146	214	160	116	NATICK		I		A-2	ERT
133	BED-10	6	5	3	2	4	6	6	4	5	10	151	211	183	151	CONCORD	C	I		C-1	SEA (502)
125	LEX-04	8	4	3.5	8	6	6	7	0	7	6	155.5	210	225	151	LEXINGTON	C	I		B-2	SEA (501)
153	STO-07	7	5	3	2	4	5	7	5	4	8	150	210	204	138	BROCKTON		I		A-2	SEA (522)
124	BOS-21	6	4	2	8	5	7	7	2	10	6	157	210	150	110 Bs St Hsp	BOSTON SOUTH	P	I		B-3	SEA (222)
160	BRO-02	5.5	3	2	5	2	7	7	8	7.5	6	153	210	118	118 PthmWCC	NEWTON		I	A	B-2	ERT
142	MEL-04	3	3.5	3	9	2	5	10	4	8.5	7	155	209	169	137 MthoodnF	BOSTON NORTH		I		A-2	ERT
169	BRO-13	6	2.5	1	3	2	7	7	8	7.5	7	151	207	134	123 TheCntrC	NEWTON		I	A	E-2	ERT
128	HLB-12	6	7	5	3	6	4	4	2	8	8	153	207	139	109	BROCKTON	C	I	A	B-2	SEA (62)
161	WNC-01	5	2	1	7	2	3	10	8	8.5	6.5	153	206	139	127 Wnchr CC	LEXINGTON		I		B-2	ERT
166	NEW-04	5	3	1	6	3	7	10	4	4.5	7	150.5	206	189	160 ChrRvCC	NEWTON		I	A	B-2	ERT
162	MIL-01	7	3	2	4	5	4	7	4	6	8	150	202	449	302	BLUE HILLS	P	I		A-1	SEA (533)
163	CAN-16	8	5	3	4	5	5	4	5	7	6	152	201	186	153	BLUE HILLS		I	A	C-1	SEA (228)
180	MIL-02	5	2	2	4	3	5	7	8	8	6	150	201	306	200	BLUE HILLS	C	I	A	C-1	SEA (532)
158	ASH-16	8	4	2	4	2	3	7	4	8	9.5	151.5	199	114	109	HOLLISTON	C	I		C-1	SEA (519)
183	MIL-03	3	7	0	0	6	5	8	6	4	7	146	198	4200	3112 BHLs Res	BLUE HILLS	P	I		A-1	SEA (265)
184	CAN-20	5	6	3	8	5	5	7	3	1	6	149	193	213	193	BLUE HILLS	P	I	A	C-1	ERT
188	BOS-22	5	3	1	1	4	7	7	4	8	6	146	190	268	261 Frank Prk	BOSTON SOUTH	P	I		A-1	SEA (223)
201	NOR-07	4	8	5	6	4	4	4	5	7	2.5	149.5	184	108	107	NORWOOD		I		B-2	ERT
222	QUI-08	2	4	3	0	5	5	7	4	5	5	140	178	523	375	BLUE HILLS	C	I		C-1	SEA (73)
226	ASH-23	6	3	1	1	4	0	10	4	2	7	138	170	646	375 Ind Brook	MARLBOROUGH	P	I		A-1	SEA (204)
229	MED-07	3	3	0	6	7	0	10	4	0	6	139	166	3158	2233 Mdlsr Res	BOSTON NORTH	P	I		A-1	SEA (255)
214	ASH-17	8	5	3	6	3	1	3	5	3	7.5	144.5	166	425	180 Ash St Pk	HOLLISTON	P	I		A-1	SEA (206)
232	WAK-03	3	3	1	1	4	5	7	4	6	5	139	165	598	508 Brkht Rs	BOSTON NORTH	P	I		A-1	SEA (281)
234	WLT-09	5.5	3	1	0	2	5.5	5	6	7	4	139	160	132	105	LEXINGTON		I		A-2	ERT
236	WEL-02	7	2	0	3	3	5	4	2	7	5.5	138.5	145	125	100 WellIslyCC	NATICK		I		B-2	ERT
235	RED-04	6.5	4	3	4.5	3	5	1	0	4.5	7.5	139	142	274	153	WILMINGTON		I		B-2	ERT
238	WOB-12	4	2	2	2	3	0	2	5	2	7	129	118	460	190	LEXINGTON		I		A-2	ERT

OWNERSHIP CODE:

P = PUBLIC

C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%

ON-SITE LAND USE CODES:

A-1 = State Park

A-2 = Town Park and/or Designated Conservation Land

B-1 = Existing, Developed Site Use (on going) and/or

New Development Under Construction

B-2 = Low Intensity Existing Site Use

(i.e. - quarry, park-ride, warehouses, drive-in theaters)

B-3 = Abandoned, Existing Land Use

INITIAL INLAND LANDFILL
SITE SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	I	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER												I RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION
B = 26 - 50%													D = 76 - 100%									
													(i.e. - abandoned warehouse)									
													C-1 = Vacant Land									
SITE ORIGINATION:													LOCATION									
ERT = ERT Site Bank													I = Inland									
SEA (number) = SEA Site bank and SEA													C = Coastal									
SEA = SEA Site bank, no number													X = Island									
designation																						
CEM = CEM Site Bank																						

INITIAL COASTAL TRANSFER SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	MET	ECO	AIR	I	SCORE	TOTAL ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGIN
1	BOS-06	6	8	9	10	6	6	7	10	10	7	1	79 219	5	5	East Jetty	BOSTON SOUTH	P	C	A	B-3	SEA
4	EVR-04	7	7	9	10	7	7	7	6	10	6	1	76 212	20	20	Chalmers	BOSTON NORTH	P	C	C	B-2	SEA (239)
6	CHE-08	5	5	8	8	6	8	7	10	10	7	1	74 207	18	18	Coburn Stns	BOSTON NORTH	C	C	A	B-3	SEA
10	BOS-17	5	7	7	8	7	6	7	10	10	6	1	73 204	24	24	US Navy R	BOSTON SOUTH	P	C	C	B-2	SEA (225)
5	BOS-30	6	7	9	8	4	9	7	10	10	6	1	76 204	13	13		BOSTON SOUTH		C	B	B-2	ERT
19	QUI-07	5	6	8	8	7	4	7	9	10	6	1	70 201	150	150	Oney Shld	WEYMOUTH	C	C	A	B-3	SEA
11	BOS-10	5	9	5	10	8	8	7	6	10	6	1	74 198	18	18	Chels. Cr	BOSTON NORTH	P	C	D	B-2	SEA (A)
12	BOS-31	6	5	8	10	4.5	6	7	9	10	7.5	1	73 196	185	5	Conley Ter	BOSTON SOUTH	C	C	B	B-2	CEM
14	BOS-19	4	5	8	10	5	8	7	10	10	6	1	73 195	19	15	Res Chan	BOSTON SOUTH	P	C	C	B-3	SEA (A)
17	CHA-07	5	4	5	8	7	8	7	10	10	7	1	71 193	12	6	Revre Sug	BOSTON NORTH	C	C	B	B-3	SEA
21	BOS-16	5	4	6	10	7	6	7	10	10	6	1	71 192	19	16	Bs Shipld	BOSTON SOUTH	C	C	A	B-3	SEA
18	BOS-18	5	5	6	8	6	8	7	10	10	6	1	71 191	17	17	SB Pier	BOSTON SOUTH	C	C	D	B-2	SEA (A)
41	BOS-23	4	9	7	4	7	5	7	6	8	6	1	63 190	50	40	Nepst Res	BOSTON SOUTH	P	C	A	A-1	SEA (224)
15	EVR-01	5	7	6	8	6	6	10	6	10	7	1	71 189	10	10	IsEd InPk	BOSTON NORTH	C	C	D	B-2	SEA (A)
39	LYN-02	4	9	8	10	6	4	6	2	10	7	1	66 185	87	48	Lynn Harb	LYNN	C	C	C	B-3	CEM
22	CHA-10	5	5	5	7	7	8	8	6	10	7	1	68 185	5	5	Self Stor	BOSTON NORTH	C	C	D	B-2	CEM
37	BOS-25	5	9	9.5	2	1	5	9	6	6	9	1	61.5 178	77	77	Spectl Is	HULL	P	X	A	B-3	ERT
31	HIN-02	6	7	3	7	6	6	7	6	7	10	1	65 177	14	14	Stods Nck	HULL	P	C	D	A-2	SEA (253)
29	BOS-13	5	5	7	10	3	6	7	10	10	6	1	69 175	22	16	Wigworth	BOSTON SOUTH	C	C	A	B-3	SEA (A)
38	BOS-04	4.5	4	6	10	5	5	7	10	10	5.5	1	67 174	8	8	BS BusPrk	BOSTON SOUTH	C	C	D	B-2	ERT
86	HIN-04	7	6	5	2	7	6	7	0	8	8	1	56 168	47	23		WEYMOUTH	C	C	A	B-3	SEA (51)
126	QUI-03	4	6	9	6	6	4	7	2	4	5	1	53 165	44	23		BOSTON SOUTH	C	C		C-1	SEA (500)
88	SOM-02	4	9	2	3	6	4	6	10	7	7	1	58 164	108	108	Mystic Res	BOSTON NORTH	P	C		A-1	SEA (280)
62	CHA-08	5	7	3	8	5	6	7	6	10	7	1	64 161	10	8	Ryn Plygr	BOSTON NORTH	C	C	D	A-2	SEA (A)
36	BOS-26	7	5	5	10	3	5	10	4	7	9	1	65 160	179	25	Deer Is	HULL	P	X	A	B-2	ERT
72	QUI-09	3	6	5	10	2	6	9	6	7	8	1	62 151	50	35	Moon Is	HULL	P	X	C	B-3	ERT
74	BOS-07	5	3	3	10	3	7	7	10	10	6	1	64 148	6	5	Es Frt Pk	BOSTON NORTH	C	C	D	B-2	SEA
151	HUL-01	5	5	5.5	0	1	4	9	4	7	9	1	149.5 136	212	179	Pdcks Is	HULL	P	X	A	C-1	ERT
139	BOS-27	6	4	5.5	6	1	4	9	2	6	9	1	152.5 133	35	27	Lovell Is	HULL	P	X	D	A-1	ERT
191	BOS-28	3	8	4	0	2	4	7	2	4	10	1	44 131	143	109	Tampson Is	BOSTON SOUTH	C	X		B-2	ERT
181	WEY-05	4	1	2	3	3	5	7	6	6	10	1	47 128	24	21	Off RivSt	HULL	P	C		A-1	SEA (295)
178	BOS-24	5	3	3	2	2	5	9	4	5	9	1	47 125	183	146	Long Is	HULL	P	X		C-1	ERT
209	WIN-02	4	5	6	7	3	4	6	0	7	5	1	47 124	24	9		LYNN	C	C		C-1	SEA (117)
204	QUI-02	4	2	4	6	2	5	7	4	7	6	1	47 116	15	7	Rye Is	HULL	P	X		C-1	SEA (272)

OWNERSHIP CODE:

P = PUBLIC

C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%

B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park

A-2 = Town Park and/or Designated Conservation Land

B-1 = Existing, Developed Site Use (on going) and/or

New Development Under Construction

B-2 = Low Intensity Existing Site Use

(i.e. - quarry, park-ride, warehouses, drive-in theaters)

B-3 = Abandoned, Existing Land Use

(i.e. - abandoned warehouse)

C-1 = Vacant Land

SITE ORIGIN:

ERT = ERT Site Bank

SEA (number) = SEA Site bank and SEA

SEA = SEA Site bank, no number

designation

CEM = CEM Site Bank

LOCATION

I = Inland

C = Coastal

X = Island

INITIAL COASTAL COMBUSTION SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE I RAW	TOTAL WGT ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGINATION
4	EVR-04	7	7	9	10	7	7	7	6	10	6	1	76 258	20	20 ChmLn/Mrv	BOSTON NORTH	P	C	C	B-2	SEA (239)
6	CHE-08	5	5	8	8	6	8	7	10	10	7	1	74 255	18	18 Cbot Strns	BOSTON NORTH	C	C	A	B-3	SEA
5	BOS-30	6	7	9	8	4	9	7	10	10	6	1	76 253	13	13	BOSTON SOUTH	C	C	B	B-2	ERT
10	BOS-17	5	7	7	8	7	6	7	10	10	6	1	73 250	24	24 US Navy R	BOSTON SOUTH	P	C	C	B-2	SEA (225)
11	BOS-10	5	9	5	10	8	8	7	6	10	6	1	74 247	18	18 Chels. Cr	BOSTON NORTH	P	C	D	B-2	SEA (A)
19	QUI-07	5	6	8	8	7	4	7	9	10	6	1	70 244	150	150 Qncy ShYd	WEYMOUTH	C	C	A	B-3	SEA
14	BOS-19	4	5	8	10	5	8	7	10	10	6	1	73 241	19	15 Res Chan	BOSTON SOUTH	P	C	C	B-3	SEA (A)
15	EVR-01	5	7	6	8	6	6	10	6	10	7	1	71 241	10	10 IsEd InPk	BOSTON NORTH	C	C	D	B-2	SEA (A)
18	BOS-18	5	5	6	8	6	8	7	10	10	6	1	71 236	17	17 SB Pier1	BOSTON SOUTH	C	C	D	B-2	SEA (A)
21	BOS-16	5	4	6	10	7	6	7	10	10	6	1	71 235	19	16 Bs ShipYd	BOSTON SOUTH	C	C	A	B-3	SEA
41	BOS-23	4	9	7	4	7	5	7	6	8	6	1	63 234	50	40 Nepst Res	BOSTON SOUTH	P	C	A	A-1	SEA (224)
37	BOS-25	5	9	9.5	2	1	5	9	6	6	9	161.5	233	77	77 Spectl Is	HULL	P	X	A	B-3	ERT
39	LYN-02	4	9	8	10	6	4	6	2	10	7	1	66 232	87	48 Lynn Harb	LYNN	C	C	C	B-3	CEM
31	HIN-02	6	7	3	7	6	6	7	6	7	10	1	65 232	14	14 Stods Nck	HULL	P	C	D	A-2	SEA (253)
29	BOS-13	5	5	7	10	3	6	7	10	10	6	1	69 219	22	16 Wiglworth	BOSTON SOUTH	C	C	A	B-3	SEA (A)
86	HIN-04	7	6	5	2	7	6	7	0	8	8	1	56 217	47	23	WEYMOUTH	C	C	A	B-3	SEA (511)
38	BOS-04	4.5	4	6	10	5	5	7	10	10	5.5	1	67 215	8	8 BS BusPrk	BOSTON SOUTH	C	C	D	B-2	ERT
36	BOS-26	7	5	5	10	3	5	10	4	7	9	1	65 213	179	25 Deer Is	HULL	P	X	A	B-2	ERT
62	CHA-08	5	7	3	8	5	6	7	6	10	7	1	64 210	10	8 Ryn Plygr	BOSTON NORTH	C	C	D	A-2	SEA (A)
88	SOM-02	4	9	2	3	6	4	6	10	7	7	1	58 209	108	108 Mystic Res	BOSTON NORTH	P	C		A-1	SEA (262)
72	QUI-09	3	6	5	10	2	6	9	6	7	8	1	62 202	50	35 Moon Is	HULL	P	X	C	B-3	ERT
126	QUI-03	4	6	9	6	6	4	7	2	4	5	1	53 202	44	23	BOSTON SOUTH	C	C		C-1	SEA (500)
151	HUL-01	5	5	5.5	0	1	4	9	4	7	9	149.5	188	212	179 Pdots Is	HULL	P	X	A	C-1	ERT
191	BOS-28	3	8	4	0	2	4	7	2	4	10	1	44 183	143	109 Tmpson Is	BOSTON SOUTH	C	X		B-3	ERT
139	BOS-27	6	4	5.5	6	1	4	9	2	6	9	152.5	182	35	27 Lovell Is	HULL	P	X	D	A-1	ERT
181	WEY-05	4	1	2	3	3	5	7	6	6	10	1	47 175	24	21 Off RivSt	HULL	P	C		A-1	SEA (295)
178	BOS-24	5	3	3	2	2	5	9	4	5	9	1	47 173	183	146 Long Is	HULL	P	X		C-1	ERT
209	WIN-02	4	5	6	7	3	4	6	0	7	5	1	47 159	24	9	LYNN	C	C		C-1	SEA (117)

OWNERSHIP CODE:

P = PUBLIC
C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%
B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park
A-2 = Town Park and/or Designated Conservation Land
B-1 = Existing, Developed Site Use (or, going) and/or
New Development Under Construction
B-2 = Low Intensity Existing Site Use
(i.e. - quarry, park-ride, warehouses, drive-in theaters)
B-3 = Abandoned, Existing Land Use
(i.e. - abandoned warehouse)
C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank
SEA (number) = SEA Site bank and SEA
SEA = SEA Site bank, no number
designation
CEM = CEM Site Bank

LOCATION

I = Inland
C = Coastal
X = Island

INITIAL COASTAL COMPOSTING SITE SUITABILITY RANKING

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER											I RAW WGT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION
19	QUI-07	5	6	8	8	7	4	7	9	10	6	70	229	150	150	Qncy Shyd WEYMOUTH	C	C	A	B-3	SEA
41	BOS-23	4	9	7	4	7	5	7	6	8	6	63	217	50	40	Nepst Res BOSTON SOUTH	P	C	A	A-1	SEA (224)
39	LYN-02	4	9	8	10	6	4	6	2	10	7	66	214	87	40	Lynn Harb LYNN	C	C	C	B-3	CEM
37	BOS-25	5	9	9.5	2	1	5	9	6	6	9	161.5	211	77	77	Spectl Is HULL	P	X	A	B-3	ERT
36	BOS-26	7	5	5	10	3	5	10	4	7	9	65	195	179	25	Deer Is HULL	P	X	A	B-2	ERT
88	SOM-02	4	9	2	3	6	4	6	10	7	7	58	191	100	100	Mystc Res BOSTON NORTH	P	C		A-1	SEA (280)
72	QUI-09	3	6	5	10	2	6	9	6	7	8	62	184	50	35	Moon Is HULL	P	X	C	B-3	ERT
151	HUL-01	5	5	5.5	0	1	4	9	4	7	9	149.5	170	212	179	Pdoks Is HULL	P	X	A	C-1	ERT
139	BOS-27	6	4	5.5	6	1	4	9	2	6	9	152.5	165	35	27	LoveII Is HULL	P	X	D	A-1	ERT
191	BOS-28	3	8	4	0	2	4	7	2	4	10	44	161	143	109	Tmpson Is BOSTON SOUTH	C	X		B-2	ERT
178	BOS-24	5	3	3	2	2	5	9	4	5	9	47	156	183	146	Long Is HULL	P	X		C-1	ERT

OWNERSHIP CODE:

P = PUBLIC
C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)
A = 0 - 25% C = 51 - 75%
B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park
A-2 = Town Park and/or Designated Conservation Land
B-1 = Existing, Developed Site Use (on going) and/or
New Development Under Construction
B-2 = Low Intensity Existing Site Use
(i.e. - quarry, park-ride, warehouses, drive-in theaters)
B-3 = Abandoned, Existing Land Use
(i.e. - abandoned warehouse)
C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank
SEA (number) = SEA Site bank and SEA
SEA = SEA Site bank, no number
designation
CEM = CEM Site Bank

LOCATION

I = Inland
C = Coastal
X = Island

INITIAL INLAND COMBUSTION SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRC	WET	ECO	AIR	SCORE 1 RANK	TOTAL WGHT	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGINATION
3	WIL-08	5	8	10	8	5	6	8	6	7	10	73	271	79	39	WILMINGTON	C	I	C	E-3	SEA (111)
2	WLP-05	8	5	8	7	4	8	10	10	8	8	76	257	9	9	NORWOOD	C	I	A	C-1	SEA (84)
9	BRN-05	7	7	7	4	6	7	7	10	10	7	72	255	26	22	BLUE HILLS	P	I	D	E-2	SEA (14)
7	BOS-29	6	8	8	7	4	9	7	10	10	6	75	250	10	10	BOSTON SOUTH		I	D	E-2	ERT
13	WIL-09	7	7	5	8	5	6	10	4	8	10	70	244	118	46	WILMINGTON	C	I	C	C-1	SEA (503)
45	WIL-04	6	8	8	6	6	6	6	0	5	10	61	240	43	9	WILMINGTON	C	I	A	C-1	SEA (110)
50	WIL-11	6	9	9	8	7	5	4	0	7	8	63	240	119	28	WILMINGTON	C	I	A	C-1	SEA (113)
24	CAN-06	7	6	6	4	5	8	6	10	7	7.5	166.5	236	14	14 Green St	NORWOOD	P	I	C	E-2	SEA (232)
55	WLP-09	7	6	7	5	5	5	3	4	10	10	62	235	84	20	MANSFIELD	C	I	C	C-1	SEA (90)
44	DED-01	5	7	6.5	7	7	7	6	0	10	8	163.5	233	14	8	NORWOOD	C	I	D	E-2	SEA (547)
28	STD-06	4	5	8.5	8	5	5	10	4	7	8	164.5	232	187	90	BLUE HILLS	C	I	B	C-1	SEA (79)
16	WLP-07	6	5	5.5	7	3	7	10	10	9	8	170.5	232	46	39	NORWOOD	C	I	A	C-1	SEA (85)
23	ASH-22	6	6	3	3	4	6	10	10	8	9.5	165.5	230	125	125	HOLLISTON	C	I	A	C-1	SEA (523)
33	BUR-03	6	7	8	7	4	5	8	4	8	8	65	230	259	102	LEXINGTON	C	I	A	C-1	SEA (24)
35	WES-02	5	7	6	7	6	6	8	4	7	8	64	230	131	111	NORWOOD	C	I	A	C-1	SEA (95)
76	WLP-14	4	6	8	6	6	4	7	0	6	10	57	229	616	90	WRENTHAM	C	I	A	C-1	SEA (69)
25	WLP-06	4	4	3	8	5	6	10	9	7	10	66	228	17	15	WRENTHAM	C	I	E	C-1	SEA (91)
30	WLP-13	7	4	5	5	5	6	10	4	8	9.5	163.5	228	291	240	MEDFIELD	C	I	B	C-1	SEA (508)
27	HLB-11	9	5	5	5	4	5	10	4	7	10	64	227	108	93	WEYMOUTH	C	I	A	C-1	SEA (515)
34	CAN-14	4	6	9	8	3	6	10	4	6	8	64	226	79	42	BLUE HILLS	P	I	A	C-1	SEA (31)
47	FRA-12	6	9	9	6	5	2	8	4	8	6	63	226	82	56	FRAMINGHAM	C	I	A	C-1	SEA (46)
40	WLP-02	5	2	3	7	6	5	6	10	10	10	64	225	18	15	WRENTHAM	C	I	A	E-3	SEA (92)
53	BED-05	3	10	10	3	4	4	10	4	8	5	61	225	21	10	WILMINGTON	C	I	C	E-3	SEA (9)
63	WEY-11	5	7	7	8	4	6	2	6	9	8	64	225	41	22	WEYMOUTH	C	I	C	E-2	SEA (106)
78	WIL-07	6	7	7	8	6	5	4	0	8	9	60	224	152	53	WILMINGTON	C	I		C-1	SEA (109)
83	NOR-03	4	5	8	0	4	5	6	8	8	8	56	222	50	46	NORWOOD	C	I		C-1	SEA (535)
54	WES-01	4	4	6	10	8	8	3	10	7	5	65	222	68	88	NORWOOD	C	I	D	C-1	SEA (96)
91	CAN-08	6	7	9	6	3	5	4	2	5	10	57	222	36	8	BLUE HILLS	C	I	D	C-1	SEA (33)
80	BUR-02	1	6	8	6	6	6	10	2	3	8	56	221	65	49	LEXINGTON	C	I		C-1	SEA (26)
71	BRN-07	5	8	8.5	8	6	4	6	2	8	6	161.5	221	31	26	WEYMOUTH	C	I	E	E-3	SEA (19)
26	ASH-20	8	5	5	7	4	8	10	4	7	8	66	221	187	182	FRAMINGHAM	C	I	A	A-2	SEA (544)
68	FRA-09	5	7	7	8	6	4	6	2	10	7	62	220	29	11	FRAMINGHAM	C	I	E	E-2	SEA (44)
65	WOB-03	4	10	6	10	6	6	8	2	0	8	60	220	132	68	WILMINGTON	C	I	D	E-3	SEA (118)
67	HLB-10	7	3	7	6	5	5	4	8	8	8	61	220	105	33	BLUE HILLS	C	I	A	C-1	SEA (61)
73	WEY-09	7	7	6	6	4	7	3	4	10	8	62	218	56	31	WEYMOUTH	C	I	E	E-2	SEA (102)
59	WEY-15	4	8	4	8	5	8	7	4	7	8	63	218	1410	50 Wym ArStn	WEYMOUTH	P	I	D	E-2	SEA (293)
49	HLB-13	7	6	4	4	3	6	10	4	7	10	61	217	343	254	WEYMOUTH	C	I	A	C-1	SEA (514)
77	NAT-02	5	8	5	7	6	3	6	4	10	7	61	214	31	26	FRAMINGHAM	C	I	E	E-2	SEA (68)
90	STD-05	2	6	9	6	4	8	10	0	2	8	55	214	382	90	BLUE HILLS	C	I	E	C-1	SEA (526)
43	WLP-04	7	4	3	7	4	8	6	10	8	8	65	213	12	9	NORWOOD	C	I	E	C-1	SEA (86)
92	LEX-02	6	8	9	9	5	6	4	0	7	6	60	213	76	43	CONCORD	C	I		C-1	SEA (66)
84	WEY-13	3	9	5	4	4	7	8	2	8	8	58	213	130	93	WEYMOUTH	C	I		E-2	SEA (105)
56	WLP-08	8	2	4	5	4	6	10	4	7	10	60	212	105	93 MCI Walpl	WRENTHAM	P	I	A	C-1	SEA (282)
87	BRN-08	7	6	6	4	5	5	7	2	7	8	57	211	34	28	WEYMOUTH	C	I		E-2	SEA (21)
75	FRA-10	5	3	5	6	5	8	4	10	8	7	61	211	37	26	FRAMINGHAM	C	I	A	C-1	SEA (45)
141	CAN-19	8	7	9	2	8	4	2	0	7	5	52	210	330	22	NORWOOD	P	I		E-3	SEA (27)
46	NOR-04	6	3	5	6	5	6	10	8	8	6	63	209	75	50	NORWOOD	C	I	B	C-1	SEA (536)
95	STD-08	7	5	4.5	1	6	5	10	2	3	9	152.5	209	534	382	BROCKTON		I		E-2	SEA (521)
111	CAN-09	6	4	8	6	3	6	4	0	8	10	55	209	53	11	BLUE HILLS	P	I	D	E-2	SEA (36)
69	BRN-10	7	6	6	7	4	5	10	0	7	8	60	208	46	22	WEYMOUTH	C	I	C	C-1	SEA (22)
127	WEY-07	5	6	7	0	4	10	4	0	8	8	52	208	32	17	WEYMOUTH	C	I		C-1	SEA (100)
61	LEX-10	5.5	3.5	4	8	4.5	3	10	7	7.5	8.5	161.5	208	84	54	CONCORD	C	I	E	A-2	ERT
58	FRA-07	8	5	5	8	3	6	6	10	6	7	64	207	11	11 Millw St	FRAMINGHAM	P	I	A	E-3	SEA (247)
81	NAT-06	6	3	4	2	4	5	10	6	6	9.5	155.5	207	113	61	NATICK	C	I	B	C-1	SEA (508)
128	HLB-12	6	7	5	3	6	4	4	2	8	8	53	205	139	109	BROCKTON	C	I	A	E-2	SEA (52)

INITIAL INLAND COMBUSTION SITE
SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER											I RANK	WTGHT	ACRES	ACRES	QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION
108	ASH-18	5	4	5	0	6	6	8	4	8	7	53	205	130	126	FRAMINGHAM	C	I	A	C-1	SEA (7)
52	BED-09	7	4	3	8	2	6	10	4	9	10	63	204	124	96	Spring St	P	I	A	C-1	SEA (214)
60	MAL-01	4	8	4	7	4	7	10	5	10	5	64	203	47	42	Romebury	C	I	D	B-2	ERT
93	REV-07	5	7	3.5	4	5	2.5	8	6	10	7	58	203	32	31	LYNN	I	I		B-2	ERT
82	WOB-11	3	5	5	10	4	7	8	4	7	7.5	160.5	202	89	75	WILMINGTON		I		B-2	ERT
89	NAT-06	6	4	5	6	5	6	8	4	7	7	58	202	65	57	NATICK	C	I	A	C-1	SEA (507)
98	CAN-03	8	4	6	6	4	6	6	2	7	8	57	201	24	13	BLUE HILLS	C	I	C	B-2	SEA (30)
115	REV-05	6	6	8	8	5	4	6	0	5	7	55	201	373	17	BOSTON NORTH	C	I	D	B-3	SEA (77)
64	NOR-06	7	2	3	2	4	8	10	10	8	6	60	198	83	28	NORWOOD	C	I	C	C-1	SEA (537)
117	WEY-12	6	5	6	6	4	6	6	0	8	8	55	198	89	32	WEYMOUTH	C	I		B-2	SEA (97)
101	STO-04	4	3	4	2	4	5	10	6	8	8	54	197	114	86	BLUE HILLS	C	I	A	B-2	SEA (525)
133	BED-10	6	5	3	2	4	6	6	4	5	10	51	197	183	151	CONCORD	C	I		C-1	SEA (502)
123	WLP-11	7	4	5	2	4	5	6	4	8	8	53	196	103	89	NORWOOD	C	I		C-1	SEA (54)
106	WOB-05	4	5	8	7	3	6	6	6	8	5	58	196	29	15	LEXINGTON	C	I		C-1	SEA (122)
48	STN-02	6	4	2	10	3	6	10	10	6.5	6.5	66	195	35	35	BearHl GC		I	D	B-2	ERT
66	FRA-11	8	6	5	7	1	5	10	6	7	7	62	195	12	12	Edwds Rd	P	I	A	B-3	SEA (248)
100	NAT-07	8	3	4	4	3	6	8	4	6	9	55	194	224	222	NATICK	C	I	A	B-2	SEA (504)
79	WOB-10	6	5	4	8	3	6	10	4	7.5	7	160.5	194	169	125	WhisperHill		I		C-1	ERT
175	WLP-10	4	4	6	2	4	5	4	2	8	9	48	194	124	53	MEDFIELD	C	I		C-1	SEA (68)
135	ASH-04	5	5	5	8	4	3	4	6	7	8	55	193	24	8	FRAMINGHAM	C	I		B-2	SEA (2)
102	WLP-15	8	2	4	5	2	6	7.5	4	7	10	155.5	193	589	504	MEDFIELD	C	I		C-1	SEA (510)
99	NAT-05	7	3	3	4	2	6	10	4	6	10	55	192	74	72	NATICK	C	I	A	B-2	SEA (506)
97	REV-06	5.5	7	3	6	4	4	7	8	9.5	5.5	159.5	191	76	17	SuffDowns		I		B-2	ERT
113	CAN-17	2	6	5	6	2	6	10	2	8	8	55	191	445	195	BLUE HILLS	P	I	B	C-1	SEA (545)
110	NED-02	7	3	4.5	2	4	7	7	8	6	6	154.5	191	117	117	NATICK	C	I	A	C-1	SEA (505)
70	STN-01	5.5	3.5	3	9	3	6	10	8.5	8.5	6	63	190	81	46	GolfCours		I	D	B-2	ERT
136	NOR-02	6	3	5	3	6	8	6	4	7	5	53	189	128	86	NORWOOD	C	I		B-2	SEA (72)
85	ARL-01	7	4	2.5	10	5	7	8	4	8	6	161.5	189		27	LEXINGTON	p	I		A-2	ERT
146	RED-03	5	6	4	6	4	5	6	2	7	8	53	189	172	98	Cap CrtGu	P	I		B-2	SEA (274)
114	LEX-09	5.5	6.5	2	2	4.5	3	10	6	7	7	153.5	189	32	32	FiskeHill		I		A-1	ERT
120	NEW-03	9	3	1	8	5	5	1	10	8	8	58	188	22	22	Pne/Gr Av	P	I	A	B-2	SEA (271)
149	FRA-16	4	5	3	4	5	5	6	4	10	7	53	188	171	74	MCI Fmsh	P	I		B-2	SEA (249)
132	ASH-10	4	5	6	6	4	3	8	4	8	6	54	188	65	59	FRAMINGHAM	C	I		B-2	SEA (5)
112	BRN-13	6	6	5	6	2	3	10	2	7	8	55	187	145	63	WEYMOUTH	C	I		C-1	SEA (517)
119	HLB-05	6	4	5	8	3	6	8	2	5	8	55	187	17	11	BLUE HILLS	C	I	A	C-1	SEA (64)
94	WLP-12	9	2	5	7	2	5	10	2	8	8	58	187	212	200	NORWOOD	C	I		C-1	SEA (534)
104	CAN-12	5	6	0	4	3	7	10	6	5	9	55	187	123	123	BLUE HILLS	P	I	A	B-2	SEA (531)
109	NED-04	4.5	2.5	4	6.5	3	6	7	9	8.5	6.5	157.5	187	44	12	NEWTON		I		B-2	ERT
154	WLP-03	6	4	4	7	5	3	6	0	10	8	53	186	28	8	NORWOOD	C	I		B-2	SEA (93)
96	BRO-04	6	2	3	8	2	6	7	9	9.5	7.5	60	186	19	19	NEWTON		I	A	B-2	ERT
125	LEX-01	5	6	6	8	3	2	10	0	8	7	55	186	27	17	CONCORD	C	I		C-1	SEA (67)
174	BRN-04	6	7	8	2	3	2	8	0	4	7	47	185	20	14	BLUE HILLS	C	I	B	C-1	SEA (16)
156	WIL-10	6	1	5	4	5	6	6	4	7	7	51	185	110	94	WILMINGTON	C	I		C-1	SEA (504)
107	HLB-09	8	3	4	4	2	5	10	4	7	8	55	185	50	33	BLUE HILLS	C	I	B	C-1	SEA (529)
153	STO-07	7	5	3	2	4	5	7	5	4	8	50	185	204	138	BROCKTON		I		A-2	SEA (522)
125	LEX-04	8	4	3.5	8	6	6	7	0	7	6	155.5	184	225	151	LEXINGTON	C	I		B-2	SEA (501)
134	DED-03	5	6	3	1	5	6	10	4	7	5	52	183	149	60	NEWTON	C	I	A	C-1	SEA (41)
143	WES-04	5	4	4	6	4	4	10	0	7	8	52	183	322	43	NORWOOD	C	I		C-1	SEA (546)
165	NED-07	5	2	3	0	4.5	6	10	4	3	8.5	46	181	160	116	NATICK		I		A-2	ERT
155	BRN-12	8	4	5	4	3	2	6	6	7	7	52	181	206	90	BLUE HILLS	C	I	A	C-1	SEA (530)
144	STO-03	8	3	3	0	3	6	10	2	7	8	50	180	48	34	BLUE HILLS	C	I		C-1	SEA (524)
173	ASH-21	6	7	6	8	5	1	6	0	6	6	51	180	186	12	HOLLISTON	C	I		B-2	SEA (3)
124	BOS-21	6	4	2	8	5	7	7	2	10	6	57	180	150	110	Bs St Hsp	P	I		B-3	SEA (222)
168	WEY-10	6	2	4	8	4	6	3	2	10	8	53	180	47	12	WEYMOUTH	C	I		B-2	SEA (101)
140	BEL-07	5	2	1	7	5	5.5	7	5	8.5	8	54	180	107	82	BelmontCC		I		B-2	ERT
163	CAN-16	8	5	3	4	5	5	4	5	7	6	52	179	186	153	BLUE HILLS		I	A	C-1	SEA (228)

INITIAL INLAND COMBUSTION SITE
SUITABILITY RANKING
(Continued)

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE I RAW WGT	TOTAL ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGINATION
171	NOR-05	7	3	7	6	4	4	6	0	8	6	151	179	159	41	NORWOOD	C	I		C-1	SEA (70)
129	MEL-06	7	3	3	7	3	4	6	7	9	7	156	179	98	88 GolfCours	BOSTON NORTH		I		B-2	ERT
162	MIL-01	7	3	2	4	5	4	7	4	6	8	150	178	449	382	BLUE HILLS	P	I		A-1	SEA (533)
177	ASH-05	7	5	4	4	4	2	6	2	8	7.5	149.5	178	35	13	FRAMINGHAM	C	I		C-1	SEA (6)
118	WES-03	7	2	3	6	2	5	10	4	8	8	155	177	126	45	NORWOOD	C	I		C-1	SEA (538)
152	LEX-07	4	4	3	7	3	4.5	8	4	8.5	7.5	153.5	177	98	21 PineMedwCC	CONCORD		I		B-2	ERT
183	MIL-03	3	7	0	0	6	5	8	6	4	7	146	177	4200	3112 Bihis Res	BLUE HILLS	P	I		A-1	SEA (265)
158	ASH-16	8	4	2	4	2	3	7	4	8	9.5	151.5	177	114	109	HOLLISTON	C	I		C-1	SEA (519)
167	BRN-11	6	7	5	6	3	4	7	0	8	6	152	175	121	26	WEYMOUTH	C	I		B-2	SEA (28)
182	WEY-14	5	2	2	4	7	5	6	7	8	1	148	175	120	71	WEYMOUTH	C	I		C-1	SEA (518)
170	BED-02	5	2	4	7	3	8	6	2	6	8	151	175	75	60	READING	C	I		C-1	SEA (513)
137	WOF-03	7	2	3	4	2	6	10	3	7.5	8	152.5	175	60	39	LEXINGTON		I		C-1	ERT
186	WOB-06	5	5	6	10	4	4	5	0	4	7	150	175	37	10	LEXINGTON	C	I		C-1	SEA (121)
157	ASH-08	7	4	2	5	4	4	7	6	6	7	152	175	50	37 Aikens Rd	MARLBOROUGH	P	I		C-1	SEA (283)
206	CAN-13	6	4	7	6	3	4	2	0	6	8	146	174	188	20	BLUE HILLS	C	I		C-1	SEA (32)
116	HLB-06	9	1	2	4	2	6	10	6	6	8	154	174	26	26	BLUE HILLS	C	I	A	B-2	SEA (528)
164	ASH-12	8	4	2	8	3	6	3	4	6	8	154	174	50	42	HOLLISTON	C	I		C-1	SEA (520)
189	CAN-01	5	6	5	4	7	4	9	0	2	4	146	172	41	15	LEXINGTON		I		C-1	ERT
187	BED-06	7	7	3	2	3	5	8	0	3	8	146	172	53	31	CONCORD		I		C-1	SEA (215)
207	NOR-01	6	6	6	6	6	4	3	0	4	5	146	171	144	28	NORWOOD	C	I		C-1	SEA (71)
150	BEL-06	5	3	2	4	3	5.5	10	5	8.5	6.5	152.5	171	205	53 McLernHosp	LEXINGTON		I		A-2	ERT
142	MIL-04	3	3.5	3	9	2	5	10	4	8.5	7	155	171	169	137 MtHoodMF	BOSTON NORTH		I		A-2	ERT
130	BEL-04	6.5	2	1	6	3	7	8	7	8.5	6.5	155.5	171	89	30 WellingsHl	LEXINGTON		I		C-1	ERT
205	NED-05	4.5	5	5	1	2	4.5	7	0	5.5	8.5	143	170	272	55	NATICK		I		B-3	ERT
195	WIL-06	1	5	6	8	6	6	6	2	3	4	147	169	63	55	WILMINGTON	C	I		B-2	SEA (116)
196	WEY-16	3	2	2	0	4	6	8	4	7	8	144	169	82	50	WEYMOUTH	C	I		C-1	ERT
148	LEX-06	5	3	2	7	2	6	10	5	5.5	7.5	153	168	97	85 WnpHall	LEXINGTON		I		A-2	ERT
184	CAN-20	5	6	3	8	5	5	7	3	1	6	145	168	213	193	BLUE HILLS	P	I	A	C-1	ERT
194	STO-02	6	4	7	7	3	5	4	2	6	5	149	167	44	33	NORWOOD	C	I		C-1	SEA (80)
176	BRO-01	5	3	2	3	2	6.5	7	7	7.5	7	150	167	65	40	NEWTON		I	B	C-1	ERT
147	QUI-04	3	4	5	8	5	6	10	4	10	1	156	166	82	22	WEYMOUTH	C	I		B-2	SEA (74)
193	WEY-04	6	2	4	4	6	6	7	0	7	5	147	166	28	12	WEYMOUTH	C	I		C-1	SEA (99)
160	BRO-02	5.5	3	2	5	2	7	7	8	7.5	6	153	166	118	118 PthamwCC	NEWTON		I	A	B-2	ERT
131	WAT-02	5	3	0	4	2	7.5	10	10	7	6	154.5	166	84	48 OakleyCC	NEWTON		I	B	B-2	ERT
169	BRO-03	6	2.5	1	3	2	7	7	8	7.5	7	151	165	134	123 TheCntrC	NEWTON		I	A	B-2	ERT
217	RAW-03	6.5	2	5	1	4	4	4	0	8.5	7	142	163	162	48	BLUE HILLS		I		C-1	ERT
180	MIL-02	5	2	2	4	3	5	7	8	8	6	150	163	306	280	BLUE HILLS	C	I	A	C-1	SEA (532)
166	NEW-04	5	3	1	6	3	7	10	4	4.5	7	150.5	163	189	160 CnrIrvCC	NEWTON		I	A	B-2	ERT
220	CAN-18	7	7	5	0	6	4	4	0	4	4	141	163	276	12	NORWOOD		I		C-1	SEA (233)
197	NED-06	7	3	1.5	1	2	5.5	7	2	7	9	145	162	79	51	NATICK		I		C-1	ERT
201	NOR-07	4	8	5	6	4	4	4	5	7	2.5	149.5	161	108	107	NORWOOD		I		B-2	ERT
188	ASH-11	7	4	3	5	2	3	7	4	7	7	149	161	86	31 Howe St	MARLBOROUGH	P	I		C-1	SEA (210)
211	BED-08	4	1	3.5	4	4	6	5	2	8	7	144.5	161	96	49	BILLERICA		I		C-1	SEA (217)
195	NED-03	7	1	2	6	4	3	6	6	4.5	7.5	147	160	117	64	NEWTON		I		B-2	ERT
198	BOS-22	5	3	1	1	4	7	7	4	8	6	146	159	268	261 Frank Prk	BOSTON SOUTH	P	I		A-1	SEA (223)
161	WNC-01	5	2	1	7	2	3	10	8	8.5	6.5	153	158	139	127 Wnchr CC	LEXINGTON		I		B-2	ERT
190	WNC-03	7	3	2	2	3	2	7	8	10	5	149	157	56	22	LEXINGTON		I		B-2	ERT
179	BOS-20	6	2	0	4	3	5	7	8	10	6	151	157	66	38 BrBay Fen	BOSTON SOUTH	P	I		A-2	SEA (221)
214	ASH-17	8	5	3	6	3	1	3	5	3	7.5	144.5	156	425	180 Ash St Pk	HOLLISTON	P	I		A-1	SEA (206)
222	QUI-08	2	4	3	0	5	5	7	4	5	5	140	156	523	375	BLUE HILLS	C	I		C-1	SEA (73)
231	BRN-14	6	0	8	2	3	1	6	0	5	7	138	156	196	28	BLUE HILLS	C	I		C-1	SEA (17)
202	FRA-03	6	1	3	4	3	4	4	10	8	5	148	155	14	8	FRAMINGHAM	C	I		C-1	SEA (48)
235	NED-01	8	6	2	2	7	3	1	0	2	6.5	137.5	154	493	37	NEWTON		I		A-2	SEA (268)
208	ASH-13	8	2	1	6	3	3	6	0	8	9	146	154	22	9 Metro. Av.	FRAMINGHAM	P	I		C-1	SEA (205)
210	WNC-02	3	2	2	2	2	5	9	5	6	7.5	143.5	154	234	45	LEXINGTON		I		C-1	ERT
227	FRA-13	6	4	5	2	2	2	3	4	8	6	142	152	103	54	FRAMINGHAM	C	I		B-2	SEA (45)

INITIAL INLAND COMBUSTION SITE
SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	I	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE	
SITE RANK	NUMBER												I RAW WSGHT	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION	
219	WAK-04	5.5	2	2	2	3	2	9	0	5	9	139.5	151	128	62	READING			I		C-1	ERT	
213	WLT-11	3	1	3	3	2	6.5	5	9	7.5	5	1	45	148	74	74	LEXINGTON			I		C-1	ERT
212	RAN-02	7.5	3	2.5	4	1	5	5	2	8.5	7	145.5	147	66	45	BLUE HILLS			I		C-1	ERT	
228	WLP-06	4.5	6	2	2	6	4	3	9	4	2	142.5	147	163	32	NATICK			I		C-1	SEA (269)	
235	RED-04	6.5	4	3	4.5	3	5	1	0	4.5	7.5	1	39	145	274	153	WILMINGTON			I		B-2	ERT
200	MEL-05	6	1	2	5	1	5	10	2	8.5	6.5	1	47	144	65	51 PrBrkPrk	BOSTON NORTH		I		A-2	ERT	
237	FRA-01	6	5	2	1	6	1	0	7.5	4	4.5	1	37	143	940	45 CochStPk	FRAMINGHAM	P	I		A-1	SEA (244)	
218	STO-01	6	2	2	8	3	5	4	2	8	6	1	46	143	27	16	NORWOOD	C	I		C-1	SEA (81)	
226	ASH-23	6	3	1	1	4	0	10	4	2	7	1	38	143	646	375 Ind Brook	MARLBOROUGH	P	I		A-1	SEA (204)	
224	LEX-05	5	1	1	5	3	6	5	2	8	7	1	43	142	107	63	LEXINGTON		I		C-1	ERT	
229	MED-07	3	3	0	6	7	0	10	4	0	6	1	39	142	3158	2233 Mdlsx Res	BOSTON NORTH	P	I		A-1	SEA (255)	
230	BEL-05	8	4	2	3	2	4	6	0	4.5	7	140.5	140	82	55	LEXINGTON			I		A-2	ERT	
232	WAK-03	3	3	1	1	4	5	7	4	6	5	1	39	139	596	508 Brkht Rs	BOSTON NORTH	P	I		A-1	SEA (281)	
225	BEL-03	7	4	2	6	4	4	5	2	8	3	1	45	135	19	13 Ev Br Res	LEXINGTON	P	I		A-1	SEA (220)	
234	WLT-09	5.5	3	1	0	2	5.5	5	6	7	4	1	39	127	132	105	LEXINGTON			I		A-2	ERT
236	WEL-02	7	2	0	3	3	5	4	2	7	5.5	138.5	124	125	100	WellslyCC	NATICK		I		B-2	ERT	
238	WOB-12	4	2	2	2	3	0	2	5	2	7	1	29	119	460	190	LEXINGTON			I		A-2	ERT

OWNERSHIP CODE:

P = PUBLIC

C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%

B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park

A-2 = Town Park and/or Designated Conservation Land

B-1 = Existing, Developed Site Use (or going) and/or
New Development Under Construction

B-2 = Low Intensity Existing Site Use

(i.e. - quarry, park-ride, warehouses, drive-in theaters)

B-3 = Abandoned, Existing Land Use

(i.e. - abandoned warehouse)

C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank

SEA (number) = SEA Site bank and SEA

SEA = SEA Site bank, no number
designation

CEM = CEM Site Bank

LOCATION

I = Inland

C = Coastal

X = Island

INITIAL INLAND COMPOSTING SITE SUITABILITY RANKING

TIER 1 SITE RANK	SITE NUMBER	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE RAW	TOTAL WGHT	TOTAL ACRES	NET ACRES	NAME	USGS QUADRANGLE	OWNER CODE	LOCATION	AVAIL STATUS	ON SITE LAND USE	SITE ORIGIN
3	WIL-08	5	8	10	8	5	6	8	6	7	10	73	249	79	39	WILMINGTON		C	I	C	B-3	SEA (111)
13	WIL-09	7	7	5	8	5	6	10	4	8	10	70	222	118	46	WILMINGTON		C	I	C	C-1	SEA (523)
50	WIL-11	6	9	9	8	7	5	4	0	7	8	63	220	119	28	WILMINGTON		C	I	A	C-1	SEA (113)
28	STO-06	4	5	8.5	8	5	5	10	4	7	8	164.5	216	187	90	BLUE HILLS		C	I	B	C-1	SEA (79)
16	WLP-07	6	5	5.5	7	3	7	10	10	9	8	170.5	215	46	39	NORWOOD		C	I	A	C-1	SEA (85)
33	BUR-03	6	7	8	7	4	5	8	4	8	8	65	212	259	102	LEXINGTON		C	I	A	C-1	SEA (20)
35	WES-02	5	7	6	7	6	6	8	4	7	8	64	212	131	111	NORWOOD		C	I	A	C-1	SEA (95)
23	ASH-22	6	6	3	3	4	6	10	10	8	9.5	165.5	211	125	125	HOLLISTON		C	I	A	C-1	SEA (523)
54	WES-01	4	4	6	10	8	8	3	10	7	5	65	211	88	88	NORWOOD		C	I	D	C-1	SEA (96)
30	WLP-13	7	4	5	5	5	6	10	4	8	9.5	163.5	210	291	240	MEDFIELD		C	I	B	C-1	SEA (529)
47	FRA-12	6	9	9	6	5	2	8	4	8	6	63	209	82	56	FRAMINGHAM		C	I	A	C-1	SEA (46)
34	CAN-14	4	6	9	8	3	6	10	4	6	8	64	209	79	42	BLUE HILLS		P	I	A	C-1	SEA (31)
76	WLP-14	4	6	8	6	6	4	7	0	6	10	57	208	616	90	WRENTHAM		C	I	A	C-1	SEA (89)
27	HLE-11	9	5	5	5	4	5	10	4	7	10	64	207	106	93	WEYMOUTH		C	I	A	C-1	SEA (515)
83	NOR-05	4	5	8	0	4	5	6	8	8	8	56	205	50	46	NORWOOD		C	I	A	C-1	SEA (535)
67	HLE-10	7	3	7	6	5	5	4	8	6	8	61	205	105	33	BLUE HILLS		C	I	A	C-1	SEA (61)
71	BRN-07	5	8	8.5	8	6	4	6	2	6	6	161.5	205	31	26	WEYMOUTH		C	I	B	B-2	SEA (15)
78	WIL-07	6	7	7	8	6	5	4	0	6	9	60	204	152	53	WILMINGTON		C	I		C-1	SEA (109)
26	ASH-20	8	5	5	7	4	8	10	4	7	6	66	204	187	182	FRAMINGHAM		C	I	A	A-2	SEA (544)
80	BUR-02	1	6	8	6	6	6	10	2	3	8	56	204	65	49	LEXINGTON		C	I		C-1	SEA (26)
73	WEY-09	7	7	6	6	4	7	3	4	10	8	62	200	56	31	WEYMOUTH		C	I	B	B-2	SEA (102)
65	WOB-06	4	10	6	10	6	6	6	2	0	8	60	199	132	68	WILMINGTON		C	I	D	B-2	SEA (118)
59	WEY-15	4	8	4	8	5	8	7	4	7	8	63	199	1410	50	Wye ArStr. WEYMOUTH		P	I	D	B-2	SEA (293)
75	FRA-10	5	3	5	6	5	8	4	10	8	7	61	198	37	26	FRAMINGHAM		C	I	A	C-1	SEA (45)
46	NOR-04	6	3	5	6	5	6	10	8	8	6	63	198	75	50	NORWOOD		C	I	B	C-1	SEA (536)
77	NAT-02	5	8	5	7	6	3	6	4	10	7	61	197	31	26	FRAMINGHAM		C	I	B	B-2	SEA (168)
92	LEX-02	6	8	9	9	5	6	4	0	7	6	60	197	76	43	CONCORD		C	I		C-1	SEA (166)
49	HLE-13	7	6	4	4	3	6	10	4	7	10	61	196	343	254	WEYMOUTH		C	I	A	C-1	SEA (514)
90	STO-05	2	6	9	6	4	6	10	0	2	8	55	196	382	90	BLUE HILLS		C	I	B	C-1	SEA (526)
56	WLP-08	8	2	4	5	4	6	10	4	7	10	60	195	105	93	MCI Walpl WRENTHAM		P	I	A	C-1	SEA (282)
87	BRN-08	7	6	6	4	5	5	7	2	7	8	57	194	34	28	WEYMOUTH		C	I		B-2	SEA (21)
84	WEY-13	3	9	5	4	4	7	8	2	8	8	58	193	130	93	WEYMOUTH		C	I		B-2	SEA (105)
61	LEX-10	5.5	3.5	4	8	4.5	3	10	7	7.5	8.5	161.5	192	84	54	CONCORD		C	I	B	A-2	ERT
95	STO-08	7	5	4.5	1	6	5	10	2	3	9	152.5	191	534	382	BROCKTON			I		B-2	SEA (521)
108	ASH-18	5	4	5	0	6	6	8	4	8	7	53	191	130	126	FRAMINGHAM		C	I	A	C-1	SEA (7)
81	NAT-06	6	3	4	2	4	5	10	6	6	3.5	155.5	190	113	61	NATICK		C	I	B	C-1	SEA (506)
60	MAL-01	4	8	4	7	4	7	10	5	10	5	64	189	47	42	RoweQuary BOSTON NORTH		C	I	D	B-2	ERT
64	NOR-06	7	2	3	2	4	8	10	10	8	6	60	188	83	26	NORWOOD		C	I	C	C-1	SEA (537)
89	NAT-06	6	4	5	6	5	6	6	4	7	7	58	188	65	57	NATICK		C	I	A	C-1	SEA (507)
128	HLE-12	6	7	5	3	6	4	4	2	8	8	53	187	139	109	BROCKTON		C	I	A	B-2	SEA (162)
82	WOB-11	3	5	5	10	4	7	8	4	7	7.5	160.5	186	89	75	WILMINGTON			I		B-2	ERT
93	REV-07	5	7	3.5	4	5	2.5	8	6	10	7	58	186	32	31	LYNN			I		B-2	ERT
52	BED-09	7	4	3	8	2	6	10	4	9	10	63	186	124	96	Spring St BILLERICA		P	I	A	C-1	SEA (214)
101	STO-04	4	3	4	2	4	5	10	6	8	8	54	182	114	86	BLUE HILLS		C	I	A	B-2	SEA (525)
48	STN-02	6	4	2	10	3	6	10	10	8.5	6.5	66	182	35	35	BearHI GC BOSTON NORTH			I	D	B-2	ERT
117	WEY-12	6	5	6	6	4	6	6	0	8	8	55	181	89	32	WEYMOUTH		C	I		B-2	SEA (97)
123	WLP-11	7	4	5	2	4	5	6	4	8	8	53	181	103	89	NORWOOD		C	I		C-1	SEA (94)
136	NOR-02	6	3	5	3	6	8	6	4	7	5	53	179	128	86	NORWOOD		C	I		B-2	SEA (72)
110	NED-02	7	3	4.5	2	4	7	7	8	6	6	154.5	179	117	117	NATICK		C	I	A	C-1	SEA (505)
79	WOB-10	6	5	4	8	3	6	10	4	7.5	7	160.5	179	169	125	Whisphill LEXINGTON			I		C-1	ERT
70	STN-01	5.5	3.5	3	9	3	6	10	8.5	8.5	6	63	178	81	46	GolfCours BOSTON NORTH			I	D	B-2	ERT
100	NAT-07	8	3	4	4	3	6	8	4	6	9	55	178	224	222	NATICK		C	I	A	B-2	SEA (504)
133	BED-10	6	5	3	2	4	6	6	4	5	10	51	177	183	151	CONCORD		C	I		C-1	SEA (502)
85	ARL-01	7	4	2.5	10	5	7	8	4	8	6	161.5	177	27	27	LEXINGTON		p	I		A-2	ERT
175	WLP-10	4	4	6	2	4	5	4	2	8	9	48	176	124	53	MEDFIELD		C	I		C-1	SEA (68)

INITIAL INLAND COMPOSTING SITE
SUITABILITY RANKING
(Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER											I	RAW WGT	ACRES	ACRES	QUADRANGLE	CODE		STATUS	LAND USE	ORIGIN
102	WLP-15	8	2	4	5	2	6	7.5	4	7	10	155.5	176	589	504	MEDFIELD	C	I		C-1	SEA (510)
99	NAT-05	7	3	3	4	2	6	10	4	6	10	155	174	74	72	NATICK	C	I	A	B-2	SEA (506)
132	ASH-10	4	5	6	6	4	3	8	4	8	6	154	174	65	59	FRAMINGHAM	C	I		B-2	SEA (5)
156	WIL-10	6	1	5	4	5	6	6	4	7	7	151	174	110	94	WILMINGTON	C	I		C-1	SEA (504)
113	CAN-17	2	6	5	6	2	6	10	2	8	8	155	173	445	195	BLUE HILLS	P	I	B	C-1	SEA (545)
94	WLP-12	9	2	5	7	2	5	10	2	8	8	158	173	212	200	NORWOOD	C	I		C-1	SEA (534)
149	FRA-16	4	5	3	4	5	5	6	4	10	7	153	173	171	74 MCI Frmn	FRAMINGHAM	P	I		B-2	SEA (249)
114	LEX-09	5.5	6.5	2	2	4.5	3	10	6	7	7	153.5	172	32	32 FiskeHill	CONCORD		I		A-1	ERT
146	RED-03	5	6	4	6	4	5	6	2	7	8	153	171	172	98 Cap CrtBu	READING	P	I		B-2	SEA (274)
125	LEX-04	8	4	3.5	8	6	6	7	0	7	6	155.5	171	225	151	LEXINGTON	C	I		B-2	SEA (501)
112	BRN-13	6	6	5	6	2	3	10	2	7	8	155	170	145	63	WEYMOUTH	C	I		C-1	SEA (517)
107	HLB-09	8	3	4	4	2	5	10	4	7	8	155	170	50	33	BLUE HILLS	C	I	B	C-1	SEA (529)
134	DED-03	5	6	3	1	5	6	10	4	7	5	152	170	149	60	NEWTON	C	I	A	C-1	SEA (41)
153	STD-07	7	5	3	2	4	5	7	5	4	8	150	168	204	136	BROOKTON		I		A-2	SEA (522)
104	CAN-12	5	6	0	4	3	7	10	6	5	9	155	168	123	123	BLUE HILLS	P	I	A	B-2	SEA (531)
143	WES-04	5	4	4	6	4	4	10	0	7	8	152	167	322	43	NORWOOD	C	I		C-1	SEA (546)
124	BOS-21	6	4	2	8	5	7	7	2	10	6	157	167	150	110 Es St Hsp	BOSTON SOUTH	P	I		B-3	SEA (222)
171	NOR-05	7	3	7	6	4	4	6	0	8	6	151	167	159	41	NORWOOD	C	I		C-1	SEA (70)
155	BRN-12	9	4	5	4	3	2	6	6	7	7	152	167	206	90	BLUE HILLS	C	I	A	C-1	SEA (530)
165	NED-07	5	2	3	0	4.5	6	10	4	3	8.5	146	167	160	116	NATICK		I		A-2	ERT
140	BEL-07	5	2	1	7	5	5.5	7	5	8.5	8	154	166	107	62 BelmontCC	LEXINGTON		I		B-2	ERT
163	CAN-16	8	5	3	4	5	5	4	5	7	6	152	166	106	153	BLUE HILLS		I	A	C-1	SEA (226)
129	MEL-06	7	3	3	7	3	4	6	7	9	7	156	165	50	88 GolfCours	BOSTON NORTH		I		B-2	ERT
144	STD-03	8	3	3	0	3	6	10	2	7	8	150	165	48	34	BLUE HILLS	C	I		C-1	SEA (524)
162	MIL-01	7	3	2	4	5	4	7	4	6	8	150	164	449	302	BLUE HILLS	P	I		A-1	SEA (533)
118	WES-03	7	2	3	6	2	5	10	4	8	8	155	163	126	45	NORWOOD	C	I		C-1	SEA (536)
116	HLB-06	9	1	2	4	2	6	10	6	6	8	154	161	26	26	BLUE HILLS	C	I	A	B-2	SEA (528)
182	WEY-14	5	2	2	4	7	5	6	7	8	148	161	120	71	WEYMOUTH	C	I		C-1	SEA (518)	
170	RED-02	5	2	4	7	3	8	6	2	6	8	151	161	75	60	READING	C	I		C-1	SEA (513)
137	WOB-09	7	2	3	4	2	6	10	3	7.5	8	152.5	161	60	39	LEXINGTON		I		C-1	ERT
157	ASH-08	7	4	2	5	4	4	7	6	6	7	152	160	50	37 Aikens Rd	MARLBOROUGH	P	I		C-1	SEA (203)
167	BRN-11	6	7	5	6	3	4	7	0	8	6	152	160	121	26	WEYMOUTH	C	I		B-2	SEA (20)
183	MIL-03	3	7	0	0	6	5	8	6	4	7	146	150	4200	3112 BHM's Res	BLUE HILLS	P	I		A-1	SEA (265)
130	BEL-04	6.5	2	1	6	3	7	8	7	8.5	6.5	155.5	159	89	30 Wellingt	LEXINGTON		I		C-1	ERT
158	ASH-16	8	4	2	4	2	3	7	4	8	9.5	151.5	159	114	109	HOLLISTON	C	I		C-1	SEA (519)
199	WIL-06	1	5	6	8	6	6	6	2	3	4	147	159	63	55	WILMINGTON	C	I		B-2	SEA (116)
150	BEL-06	5	3	2	4	3	5.5	10	5	8.5	6.5	152.5	159	205	53 McLennosp	LEXINGTON		I		A-2	ERT
207	NOR-01	6	6	6	6	6	4	3	0	4	5	146	158	144	28	NORWOOD	C	I		C-1	SEA (71)
164	ASH-12	8	4	2	8	3	6	3	4	8	8	154	158	50	42	HOLLISTON	C	I		C-1	SEA (520)
142	MEL-04	3	3.5	3	9	2	5	10	4	8.5	7	155	157	169	137 MthoodMP	BOSTON NORTH		I		A-2	ERT
194	STD-02	6	4	7	7	3	5	4	2	6	5	149	156	44	33	NORWOOD	C	I		C-1	SEA (60)
196	WEY-16	3	2	2	0	4	6	8	4	7	8	144	155	82	50	WEYMOUTH	C	I		C-1	ERT
148	LEX-06	5	3	2	7	2	6	10	5	5.5	7.5	153	154	97	85 WnpIHill	LEXINGTON		I		A-2	ERT
160	BRO-02	5.5	3	2	5	2	7	7	8	7.5	6	153	154	118	118 PthMcwCC	NEWTON		I	A	B-2	ERT
131	WAT-02	5	3	0	4	2	7.5	10	10	7	6	154.5	154	84	48 OakleyCC	NEWTON		I	B	B-2	ERT
184	CAN-20	5	6	3	8	5	5	7	3	1	6	149	154	213	193	BLUE HILLS	P	I	A	C-1	ERT
176	BRO-01	5	3	2	3	2	6.5	7	7	7.5	7	150	153	65	40	NEWTON		I	B	C-1	ERT
187	BED-06	7	7	3	2	3	5	8	0	3	8	146	153	53	31	CONCORD		I		C-1	SEA (215)
205	NED-05	4.5	5	5	1	2	4.5	7	0	5.5	8.5	143	153	272	55	NATICK		I		B-3	ERT
169	BRO-03	6	2.5	1	3	2	7	7	8	7.5	7	151	152	134	123 TheCntrC	NEWTON		I	A	B-2	ERT
180	MIL-02	5	2	2	4	3	5	7	8	8	6	150	152	306	280	BLUE HILLS	C	I	A	C-1	SEA (532)
217	BRN-03	6.5	2	5	1	4	4	4	0	8.5	7	142	151	162	48	BLUE HILLS		I		C-1	ERT
201	NOR-07	4	8	5	6	4	4	4	5	7	2.5	149.5	150	108	107	NORWOOD		I		B-2	ERT
166	NEW-04	5	3	1	6	3	7	10	4	4.5	7	150.5	149	189	160 ChrIRVCC	NEWTON		I	A	B-2	ERT
211	BED-08	4	1	3.5	4	4	6	5	2	8	7	144.5	149	96	49	BILLERICA		I		C-1	SEA (217)
198	BOS-22	5	3	1	1	4	7	7	4	8	6	146	148	268	261 Frank Prk	BOSTON SOUTH	P	I		A-1	SEA (223)

INITIAL INLAND COMPOSTING SITE SUITABILITY RANKING (Continued)

TIER 1	SITE	ENG	NOI	LAN	CUL	TRA	SUR	GRO	WET	ECO	AIR	SCORE	TOTAL	NET	NAME	USGS	OWNER	LOCATION	AVAIL	ON SITE	SITE
SITE RANK	NUMBER											I RANK	ACRES	ACRES		QUADRANGLE	CODE		STATUS	LAND USE	ORIGINATION
195	NED-03	7	1	2	6	4	3	6	6	4.5	7.5	1	47	148	117	64	NEWTON		I	B-2	ERT
188	ASH-11	7	4	3	5	2	3	7	4	7	7	1	49	147	86	31 Howe St	MARLBOROUGH	P	I	C-1	SEA (210)
161	WNC-01	5	2	1	7	2	3	10	8	8.5	6.5	1	53	147	139	127 Wnchtr CC	LEXINGTON		I	B-2	ERT
179	BOS-20	6	2	0	4	3	5	7	8	10	6	1	51	146	66	38 BkBay Fer	BOSTON SOUTH	P	I	A-2	SEA (221)
197	NED-06	7	3	1.5	1	2	5.5	7	2	7	9	1	45	146	79	51	NATICK		I	C-1	ERT
231	BRN-14	6	0	8	2	3	1	6	0	5	7	1	38	145	136	28	BLUE HILLS	C	I	C-1	SEA (17)
222	QUI-08	2	4	3	0	5	5	7	4	5	5	1	40	144	523	375	BLUE HILLS	C	I	C-1	SEA (73)
210	WNC-02	3	2	2	2	2	5	9	5	6	7.5	143.5	141	234	45	LEXINGTON		I	C-1	ERT	
214	ASH-17	8	5	3	6	3	1	3	5	3	7.5	144.5	140	425	180 Ash St Pk	HOLLISTON	P	I	A-1	SEA (206)	
213	WLT-11	3	1	3	3	2	6.5	5	9	7.5	5	1	45	140	74	74	LEXINGTON		I	C-1	ERT
227	FRA-13	6	4	5	2	2	2	3	4	8	6	1	42	139	103	54	FRAMINGHAM	C	I	B-2	SEA (49)
235	NED-01	8	6	2	2	7	3	1	0	2	6.5	137.5	139	493	37	NEWTON		I	A-2	SEA (268)	
228	WLT-06	4.5	6	2	2	6	4	3	9	4	2	142.5	139	163	32	NATICK		I	C-1	SEA (289)	
219	WAT-04	5.5	2	2	2	3	2	9	0	5	9	139.5	136	128	62	READING		I	C-1	ERT	
212	RAN-02	7.5	3	2.5	4	1	5	5	2	6.5	7	145.5	134	66	45	BLUE HILLS		I	C-1	ERT	
200	MEL-05	6	1	2	5	1	5	10	2	8.5	6.5	1	47	133	65	51 PnBrkPrk	BOSTON NORTH		I	A-2	ERT
237	FRA-01	6	5	2	1	6	1	0	7.5	4	4.5	1	37	132	940	45 CoenStPk	FRAMINGHAM	P	I	A-1	SEA (244)
224	LEX-05	5	1	1	5	3	6	5	2	8	7	1	43	131	107	63	LEXINGTON		I	C-1	ERT
229	MED-07	3	3	0	6	7	0	10	4	0	6	1	39	130	3158	2233 MdIsx Res	BOSTON NORTH	P	I	A-1	SEA (255)
235	RED-04	6.5	4	3	4.5	3	5	1	0	4.5	7.5	1	39	130	274	153	WILMINGTON		I	B-2	ERT
226	ASH-23	6	3	1	1	4	0	10	4	2	7	1	38	129	646	375 Ind Brook	MARLBOROUGH	P	I	A-1	SEA (204)
232	WAT-03	3	3	1	1	4	5	7	4	6	5	1	39	128	598	508 Brkht Ps	BOSTON NORTH	P	I	A-1	SEA (281)
225	BEL-05	8	4	2	3	2	4	6	0	4.5	7	140.5	126	82	55	LEXINGTON		I	A-2	ERT	
234	WLT-09	5.5	3	1	0	2	5.5	5	6	7	4	1	39	118	132	105	LEXINGTON		I	A-2	ERT
236	WEL-02	7	2	0	3	3	5	4	2	7	5.5	136.5	114	125	100 wellislyCC	NATICK		I	B-2	ERT	
238	WOB-12	4	2	2	2	3	0	2	5	2	7	1	29	107	460	190	LEXINGTON		I	A-2	ERT

OWNERSHIP CODE:

P = PUBLIC

C = PRIVATE

AVAILABILITY STATUS CODES:

(% OF SITE IN USE OR UNDER DEVELOPMENT)

A = 0 - 25% C = 51 - 75%

B = 26 - 50% D = 76 - 100%

ON-SITE LAND USE CODES:

A-1 = State Park

A-2 = Town Park and/or Designated Conservation Land

B-1 = Existing, Developed Site Use (on going) and/or

New Development Under Construction

B-2 = Low Intensity Existing Site Use

(i.e. - quarry, park-ride, warehouses, drive-in theaters)

B-3 = Abandoned, Existing Land Use

(i.e. - abandoned warehouse)

C-1 = Vacant Land

SITE ORIGINATION:

ERT = ERT Site Bank

SEA (number) = SEA Site bank and SEA

SEA = SEA Site bank, no number
designation

CEM = CEM Site Bank

LOCATION

I = Inland

C = Coastal

X = Island

Appendix B
Site Selection Criteria Fact Sheets

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 2nd for landfill; 17th for dual technology; 19th for composting and 31st for combustion
Flexibility	Partially Satisfies	Site size, 182 net acres, provides adequate flexibility for technology application. However, topography is not conducive to landfilling.
Development Status	Fully Satisfies	Site is undeveloped and there are no known development plans.
System Compatibility	Fully Satisfies	Westerly location of the site is compatible with the Walpole or Stoughton processing sites.
Transportation Access	Partially Satisfies	Access is from I-90 onto Oak Street. Some residences are on site access routes. Rail line is >1 km south.
Permitting Feasibility	Partially Satisfies	Site would have to be taken out of park use.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Landfill ranking of the two sites are ASH-22, 1st and ASH-18, 13th. The sites ranked 11th and 38th, respectively, for dual technology, 13th and 42nd, respectively, for composting, and 20th and 56th, respectively, for combustion.
Flexibility	Fully Satisfies	The combined acreage of these two sites is 290 acres.
Development Status	Fully Satisfies	Both sites are undeveloped, and wooded. ASH-18 encompasses the Nyanza Hazardous Waste site. Of the combined site, approximately 50% is zoned residential and 50% is zoned industrial.
System Compatibility	Fully Satisfies	The westerly location of this site would combine well with either the Stoughton or Walpole processing sites.
Transportation Access	Fully Satisfies	Access would be from the north (ASH-18), through an industrial area. There is an active rail line abutting the north end of the site.
Permitting Feasibility	Partially Satisfies	There is a "21E" site located on a portion of the site. However, adequate acreage outside of this area would not be affected.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 11th from the landfill list, 27th for dual technology, 32nd for composting, and 46th for combustion.
Flexibility	Partially Satisfies	Site area is 96 acres. Effective capacity would be minimal for landfill.
Development Status	Fully Satisfies	There are no known development plans for this forested site. The site is owned by Middlesex Community College, currently used for passive recreation. Site is zoned 100% residential.
System Compatibility	Fully Satisfies	As a landfill this site would combine well with the Lynn Coastal site and the Wilmington processing site.
Transportation Access	Partially Satisfies	Direct access from Rt. 3 to Concord Road onto Spring Street. Access is through residential areas.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles with this site.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 2nd for both dual and composting technologies, 11th for combustion and 13th for coastal transfer.
Flexibility	Fully Satisfies	There are 40 net acres on this site, providing adequate flexibility.
Development Status	Does not Satisfy	Construction is under way on buildings associated with the Neponset Reservation park.
System Compatibility	Fully Satisfies	The southerly location of this coastal site matches with the Stoughton or Walpole sites for processing and the Walpole or Ashland landfill options.
Transportation Access	Fully Satisfies	Site is accessible directly from Rt. 3. There is a rail line on site. Deep water access may require some dredging.
Permitting Feasibility	Partially Satisfies	Site is now being developed as a park. Change of status would require legislative action.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 3rd for both dual technology and composting and ranks 12th for combustion.
Flexibility	Fully Satisfies	Net area of the site is approximately 80 acres, providing significant flexibility.
Development Status	Partially Satisfies	Site is being considered for disposal of spoils from Third Harbor Tunnel. Site is in the Boston Harbor and is zoned 100% industrial.
System Compatibility	Fully Satisfies	Proximity to Deer Island, QUI-07, and LYN-02 is good by barge.
Transportation Access	Partially Satisfies	Transportation access would be by barge or pipeline. No pier or deep water island access is currently established.
Permitting Feasibility	Partially Satisfies	There are existing existing hazardous waste considerations with site. Site has been used as a quarantine hospital, rendering factory, city garbage grease reclaiming factory and a raw garbage and rubbish dump.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 5th for both dual technology and composting and 18th for combustion.
Flexibility	Partially Satisfies	Projected acreage availability may limit flexibility.
Development Status	Fully Satisfies	Site is partially developed. The wastewater treatment facility will be on this site.
System Compatibility	Fully Satisfies	There are significant logistical advantages to locating residuals processing at the wastewater treatment site.
Transportation Access	Partially Satisfies	Access would be by barge.
Permitting Feasibility	Fully Satisfies	No known major permitting obstacles.

Site ID: BOS-27

LOVELL ISLAND

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 10th for dual technology; 9th for composting and 25th for combustion.
Flexibility	Partially Satisfies	Site net area is 27 acres, which may limit flexibility.
Development Status	Fully Satisfies	The site is currently undeveloped and used as a recreational area. Island is zoned 100% retail and business.
System Compatibility	Partially Satisfies	Site is out further in the Harbor than some of the other island choices. This site could be matched either with the southern Quincy or the northern Lynn coastal sites.
Transportation Access	Partially Satisfies	Access would be by barge or pipeline.
Permitting Feasibility	Fully Satisfies	There are no known major permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 9th for dual technology, 10th for composting, 24th for combustion and 30th for coastal transfer.
Flexibility	Fully Satisfies	There are 109 net acres on the site, providing significant flexibility.
Development Status	Partially Satisfies	Site is currently undeveloped and used for educational and recreational purposes. There are no plans to alter this use.
System Compatibility	Fully Satisfies	Proximity to Deer Island and QUI-07 is very good.
Transportation Access	Partially Satisfies	Access would be by barge or pipeline.
Permitting Feasibility	Fully Satisfies	There are no known major permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 6th for landfill; 5th for dual technology; 6th for composting and 13th for combustion.
Flexibility	Fully Satisfies	Site net area is 102 acres providing adequate flexibility.
Development Status	Fully Satisfies	Site is undeveloped. There are no known development plans for the site. Town owned. Zoned 100% industrial.
System Compatibility	Fully Satisfies	The northern location of this site combines well with the Lynn coastal site and, as a processing option, with the Malden landfill site; or, as a landfill option, with the Wilmington processing option.
Transportation Access	Does not satisfy	There is no direct existing access to site except through a dense residential area to the west of the site. There are no rail lines within 2 km.
Permitting Feasibility	Partially Satisfies	The site was recently taken by eminent domain by the Town in order to protect the water supply aquifer. There is a municipal water supply well field approximately 800 m. east of site.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Partially Satisfies	Ranks 16th for landfill; 58th for dual technology; 70th for composting; 92nd for combustion.
Flexibility	Fully Satisfies	123 net available acres provides adequate flexibility.
Development Status	Partially Satisfies	Current site use is a golf course. The site is zoned 100% residential.
System Compatibility	Fully Satisfies	Matches with Quincy coastal site and Walpole and Stoughton processing sites.
Transportation Access	Fully Satisfies	Highway access is good via Rts. 128/138. There is no rail access.
Permitting Feasibility	Partially Satisfies	There is one on-site enlarged species; 10 within 1 km and the site has significant habitat.

SITE ID: HLB-11

SYCAMORE STREET

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranks 5th for landfilling, 9th for dual technologies, 14th for composting, and 18th for combustion.
Flexibility	Fully Satisfies	90+ acre availability provides flexibility for multiple technologies.
Development Status	Fully Satisfies	Site is undeveloped and there are no known development plans that would preclude use of the site.
System Compatibility	Fully Satisfies	As a potential landfill site, matches well with Stoughton and Walpole processing locations. As a processing site, matches well with Quincy for transfer and Walpole for landfill.
Transportation Access	Does not Satisfy	Highway access would be through residential areas in Abington, a non-MWRA member community.
Permitting Feasibility	Does not Satisfy	Direct hydrologic connection to a surface water reservoir (Class A) less than 600 meters away.



Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranked 8th for landfilling; 23rd for dual technology; 29th for composting; and 38th for combustion.
Flexibility	Fully Satisfies	The 254 net acres available on site provide adequate flexibility.
Development Status	Fully Satisfies	There are no known development plans for this site. Site is undeveloped.
System Compatibility	Fully Satisfies	As a potential landfill site, matches with either Stoughton or Walpole processing sites, and the Quincy coastal site.
Transportation Access	Does not Satisfy	Highway access would be through a residential area of Abington, a non-MWRA member community. There are no rail lines within 2 km of the site.
Permitting Feasibility	Does not Satisfy	Direct hydrologic connection to a surface water reservoir (Class A) 1 km to the north.



SITE ID: HUL-01

PEDDOCKS ISLAND

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 8th for both dual technology and composting; and 23rd for combustion.
Flexibility	Fully Satisfies	Site net area is 179 acres, providing adequate flexibility.
Development Status	Partially Satisfies	Site is undeveloped. There are no plans to alter the present recreational use of the island. Site is zoned 95% residential and 5% commercial.
System Compatibility	Partially Satisfies	Harbor location of the site is compatible with the southern Quincy coastal site.
Transportation Access	Partially Satisfies	Transportation access would be via barge or pipeline.
Permitting Feasibility	Fully Satisfies	There are no known major permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 4th for both dual technology and composting, ranks 14th for combustion and 16th coastal transfer.
Flexibility	Fully Satisfies	There are 48 net acres available on this site. This area value, the high rankings, and the variety of transportation options result in good flexibility potential.
Development Status	Fully Satisfies	Development proposals have been submitted, but no approvals are in place. Surrounding area is dense commercial/industrial activity. Site is zoned 100% industrial.
System Compatibility	Fully Satisfies	This northerly coastal location matches with the Wilmington processing site and the Malden or Bedford landfill options.
Transportation Access	Fully Satisfies	There is deep water coastal access to the site. Rail access is within 1/2 km to the site and road access is via route 1A.
Permitting Feasibility	Fully Satisfies	There are no known major permitting obstacles.

SITE ID: MAL-01

ROWE QUARRY

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranking for a landfill is 10th. Site ranks 34th for dual technology, 37th for composting and 58th for combustion.
Flexibility	Fully Satisfies	Quarry has significant volume to support landfilling.
Development Status	Fully Satisfies	Several proposals for developing this site have been submitted; no formal approvals have been issued. Site is zoned 100% highway business.
System Compatibility	Fully Satisfies	This landfill option would match well with the Lynn coastal site and the Wilmington processing site.
Transportation Access	Fully Satisfies	Road access is off Route 1. There is a rail line within 1/2 km of the site.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles with this site.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Partially Satisfies	Ranks 15th for landfill; 58th for dual technology; 70th for composting; and 72nd for combustion.
Flexibility	Fully Satisfies	The 222 net acres available provides adequate flexibility
Development Status	Fully Satisfies	Site is undeveloped with new residential development to the north.
System Compatibility	Fully Satisfies	Matches with Quincy coastal site; and Stoughton and Walpole processing sites.
Transportation Access	Partially Satisfies	Site access would be via town roads through dense residential areas.
Permitting Feasibility	Partially Satisfies	There is one historical/archeological register property on-site. Site abuts dense residential areas on three sides. There are three active wells within 1 km.

SITE ID: NED-02

WEST OF NORTH HILL

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Partially Satisfies	Ranks 12th for landfill. 48th for dual technology; 47th for composting only; ml, 7th for combustion only.
Flexibility	Fully Satisfies	117 net available acres provides adequate flexibility.
Development Status	Fully Satisfies	There are no known development plans. Site is zoned 50% residential and 50% institutional.
System Compatibility	Fully Satisfies	Would match with Quincy coastal site and Walpole and Ashland sites.
Transportation Access	Fully Satisfies	Highway access is off Route 135; there is no rail access.
Permitting Feasibility	Partially Satisfies	There are on-site historical/archeological properties; significant residential areas abutting; two threatened or endangered species nearby with significant on-site habitat; and a water supply well within 1 km.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranked 1st for dual technologies and composting only, ranked 6th for combustion and transfer only.
Flexibility	Fully Satisfies	150 acre size, good rail access, good coastal access and previous site history contribute to high degree of flexibility
Development Status	Fully Satisfies	While several development plans have been proposed, none have progressed to the approval stage.
System Compatibility	Fully Satisfies	Southerly location matches with the Stoughton and Walpole processing locations. Rail access links with Walpole and Ashland sites. Water access links with Deer and Spectacle Islands.
Transportation Access	Fully Satisfies	Barge access via the Fore River is 9 nautical miles from Deer Island. Highway access is via facilities heavily utilized by commuters. There are pier and berthing facilities, and rail spurs on site.
Permitting Feasibility	Partially Satisfies	The site has some previous contamination (21E).

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 7th for both dual technology and composting; and ranks 21st for combustion.
Flexibility	Fully Satisfies	Site net area is 35 acres. This and the relatively high ranking of the site in the lists fulfill the flexibility criteria.
Development Status	Fully Satisfies	There are no known development plans for this site. Island is presently used as a practice area for the Boston fire department and police force, and for recreation.
System Compatibility	Partially Satisfies	Harbor location of site is compatible with the southern Quincy coastal site. An additional coastal site to transport ash or compost inland would be necessary.
Transportation Access	Partially Satisfies	Highway access via a single narrow causeway. No deep water access currently exists.
Permitting Feasibility	Fully Satisfies	There are no known major permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site tanks 6th for both dual technology and composting, 20th for combustion and 23rd for coastal transfer.
Flexibility	Fully Satisfies	108 net acres exist on this site providing significant flexibility.
Development Status	Does not Satisfy	Site is Mystic River Reservation. There are no known plans to alter this use. Use is unique to this area. Site is zoned 100% recreational.
System Compatibility	Partially Satisfies	This central coastal location would match best with the Wilmington processing and either the Malden or Bedford landfill sites.
Transportation Access	Partially Satisfies	Water access involves crossing under five bridges and may entail significant dredging. There is rail access within 1/2 km.
Permitting Feasibility	Partially Satisfies	Site is now a park. Change of status would require legislative action.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranks 3rd for dual technologies and composting only, ranks 8th for combustion only, ranks 1st for landfill.
Flexibility	Fully Satisfies	90 acre size provides adequate flexibility
Development Status	Fully Satisfies	Site is undeveloped. There are no known development plans that would preclude use of the site.
System Compatibility	Fully Satisfies	Southerly location links with the Quincy Coastal site and either the Walpole or Ashland landfill locations.
Transportation Access	Fully Satisfies	There is direct access from Route 24 to 139/Turnpike Street. There is existing truck traffic via these routes to other industrial uses nearby.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles.

SITE ID: STO-08 STOUGHTON RIFLE RANGE

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranks 14th for landfill; 35th for composting; 28th for dual technology; and 48th for combustion.
Flexibility	Fully satisfies	382 net acres provide significant flexibility.
Development Status	Fully Satisfies	There are no known development plans for the site. Site is zoned 100% residential.
System Compatibility	Fully Satisfies	Southerly location would link with the Quincy coastal location and a Walpole or Stoughton processing site.
Transportation	Fully Satisfies	Site access directly off Rt. 138 passes through residential areas; there is on-site rail access.
Permitting Feasibility	Does not Satisfy	There are surface water bodies and wetlands on-site and potentially limited depth to ground water. Site underlain 25% by a moderate yield aquifer. There are two active wells with in 1 km of site.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Ranks 4th for dual technologies, 5th for composting only and 12th for combustion only.
Flexibility	Fully Satisfies	39 net acres available with nearby rail access as a transportation option provides adequate flexibility.
Development Status	Fully Satisfies	1/2 site is an abandoned industrial office building and grounds for sale; 1/2 site is an undeveloped, forested lot. No plans for site development or purchase have been noted.
System Compatibility	Fully Satisfies	Southerly location links with the southerly coastal site in Quincy and either a Walpole or Ashland landfill location.
Transportation Access	Fully Satisfies	Access is via Washington Street, a two-lane arterial with mixed residential and commercial uses. Rail lines abut the site.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles which could preclude consideration of this site for residuals processing.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 9th for landfill; 26th for dual technology; 30th for composting only and 43rd for combustion only.
Flexibility	Partially Satisfies	Site area, 93 net acres, meets the minimum landfill area needs. Additional technologies on-site would not be feasible.
Development Status	Fully Satisfies	No known development plans have been filed for this site. Site is zoned 100% rural.
System Compatibility	Fully Satisfies	This landfill option would combine well with the Quincy coastal location, and either the Stoughton or Walpole processing sites.
Transportation Access	Fully Satisfies	Site access is directly off Rt. 1A. Rail access is 200m east of the site.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Partially Satisfies	Ranks 14th for landfill; 57th for dual technology; 60th for composting only; and 90th for combustion only.
Flexibility	Fully Satisfies	The 200 net available acres provided adequate flexibility.
Development Status	Fully Satisfies	There are no known development plans for this site which is 80% forested and 20% agricultural. Zoning is 100% residential.
System Compatibility	Fully Satisfies	Matches with Quincy coastal site, and Stoughton and Walpole processing sites.
Transportation Access	Partially Satisfies	Access is only via town roadways through residential areas.
Permitting Feasibility	Partially Satisfies	Site is contiguous to dense residential areas.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	WLP-13: landfill ranking - 3rd, dual technology and composting - 9th and combustion 15th. WLP-15: landfill ranking-17th, dual technology - 32nd, composting - 41st, and combustion - 56th.
Flexibility	Fully Satisfies	Net area for WLP-13 is <u>+185</u> acres and for WLP-15 is <u>+290</u> acres. In addition there is land in between the two sites. Total area recorded is approximately 675 net acres. Adequate area exists to fulfill landfill and additional technology space requirements.
Development Status	Fully Satisfies	There is ongoing residential development to the NW and S of the combined site boundary definition, but adequate acreage would still be available.
System Compatibility	Fully Satisfies	This site matches with the Quincy coastal site and either the Walpole or Stoughton processing sites.
Transportation Access	Fully Satisfies	As combined, this site has direct access from Rt. 109. There is no rail access.
Permitting Feasibility	Partially Satisfies	Site is underlain 100% by a low yield aquifer, <100 gal/min. There are no wells within 1 km of the site. Wetlands bisect the site.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 8th for dual technology; 12th for composting; 16th for combustion and 17th for landfill.
Flexibility	Fully Satisfies	Site has a net area of 90 acres, providing adequate flexibility.
Development Status	Partially Satisfies	There is a tentative approval for an industrial development at the northern part of the site - adequate acreage remains to the south. There are no known plans for this area, a portion of which is Town Conservation Land.
System Compatibility	Fully Satisfies	This processing site matches with the Quincy coastal site and the Walpole or Ashland Landfill sites.
Transportation Access	Partially Satisfies	Regional access is from Rt. 1. Immediate site access would be via minor roadways through residential neighborhoods. There are active rail lines on-site.
Permitting Feasibility	Partially Satisfies	90% of site is in a 100 year flood plain. 25% of site is underlain by a medium to high yield aquifer. There are several wells within 1 km of the site, and there is significant wetland acreage.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	Site ranks 7th for landfill, 6th for dual technology, and 14th for combustion.
Flexibility	Fully Satisfies	Approximately 111 available acres provide adequate flexibility.
Development Status	Does not Satisfy	Proposals for developing this site are in the final approval stages; construction is imminent.
System Compatibility	Fully Satisfies	The southwesterly location of this landfill option combines well with the Quincy coastal site and with the Stoughton or Walpole processing sites.
Transportation Access	Fully Satisfies	There is direct road access from Rt. 128 onto Rt. 109. There are no rail lines within 2 km.
Permitting Feasibility	Partially Satisfies	There are 3 active water supply wells within 1 km.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	The dual technology and composting rankings for these sites are 1st and 2nd respectively; and 1st and 4th for combustion only.
Flexibility	Fully Satisfies	The combined area for these two sites is 50 acres which provides adequate flexibility.
Development Status	Partially Satisfies	The surrounding area is intensely developed (ing) industrial park. There are current development proposals for this site, but lack of sewer hookups has delayed final approvals.
System Compatibility	Fully Satisfies	The northerly location of this site matches with the Lynn coastal site and either the Malden or Bedford landfill sites.
Transportation Access	Fully Satisfies	Direct access from I-93 N to Rt. 125 E onto Ballardvale Road. Nearest rail lines are 500 m West.
Permitting Feasibility	Fully Satisfies	There are no known permitting obstacles.

Site Selection Criteria	Conclusion Relative to Meeting Site Selection Criteria	Key Site Observations Relative to Criteria Application
Ranking	Fully Satisfies	As a landfill option, site ranks 13th. Dual technology ranking is 45th, composting is 51st and combustion is 73rd.
Flexibility	Fully Satisfies	The site has 125 net acres, which provides adequate flexibility.
Development Status	Fully Satisfies	SE corner of site is a new housing development, there are no known plans for the remainder of the site.
System Compatibility	Fully Satisfies	Northerly location of site would combine well with the Lynn coastal location and the Wilmington processing site.
Transportation Access	Partially Satisfies	Regional transportation is off Rt. 128 onto Rt. 3. Immediate site access is through residential neighborhoods.
Permitting Feasibility	Partially Satisfies	Site may be part of town watershed protection area.

Appendix C

Site Environmental Data Summaries

APPENDIX C
DESCRIPTION OF RECOMMENDED SITES

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
QUL-07 City of Quincy	<ul style="list-style-type: none"> The site is completely developed and is on the Weymouth Fore River. Topography is flat. There are confirmed contamination problems on-site. 	<ul style="list-style-type: none"> Residences to the south are buffered by 100 m of vegetation. Howard St. (west) is mixed commercial and residential. Noise sources are heavy traffic on Rt. 53 and Rt. 3A and other industrial activity in the area. 	<ul style="list-style-type: none"> Current site use is an abandoned ship building facility. The area around this site is general industrial and commercial use. Site is zoned 100% industrial. 	<ul style="list-style-type: none"> There is one historical register or archeological property within 1 km of the site. 	<ul style="list-style-type: none"> The site has both rail and water access capabilities. Road access is Rt 3A to South St. This immediate area has ongoing traffic congestion concerns. 	<ul style="list-style-type: none"> The site is on the Weymouth River and is covered 40% by a 100 year flood plain. Water quality classification is SB - saline. 	<ul style="list-style-type: none"> Area unmapped. Potential for fresh water aquifer of low to average yield. There are no wells within 2 km of the site. 	<ul style="list-style-type: none"> There are no wetlands noted on the site. There are mud flats along the river. 	<ul style="list-style-type: none"> There are no threatened or endangered species concerns on the site or within 1 km of the site. 	<ul style="list-style-type: none"> Impact area classification within 3 km is about 50% residential and the remainder is mixed industrial commercial. The terrain is generally flat and coastal. Good ventilation conditions. The site is in a non-attainment area for both CO and TSP.
BOS-23 City of Boston	<ul style="list-style-type: none"> Soil is unfavorable - characterized by wet substratum. Site has little to no topographic relief. Closed dump on-site. Potential for on-site contamination. 	<ul style="list-style-type: none"> The Neponset River Reservation is south of the site. Residences are well buffered from site by Rt. 3, Neponset River and commercial activity in the area. Major noise sources: Rt. 3, commercial and light industrial activity in the area. 	<ul style="list-style-type: none"> Site is currently in process of being developed into an MDC park. South of site is the Neponset River Reservation, east Neponset River west Rt. 3, north industry. Site is zoned 100% industrial. 	<ul style="list-style-type: none"> There are 2 historical register or archeological properties on-site and many in the vicinity. 	<ul style="list-style-type: none"> Rail access abutts site to the west. Water access would require minimal dredging of the Neponset River to the north of the site. Road access - direct exit ramp off Rt. 3. 	<ul style="list-style-type: none"> Site is bordered on two sides by the Neponset River. 10% of the site is in a 100 year flood plain. Water quality classification is SB-saline. 	<ul style="list-style-type: none"> Area not mapped. Potential for fresh water aquifer of low to medium yield. There are no wells within 2 km of the site. 	<ul style="list-style-type: none"> There are no on-site wetlands. Mud flats associated with the Neponset River border two sides of the site. 	<ul style="list-style-type: none"> There are no threatened or endangered species listed within 1 km of the site. The preservation of this area for a recreational park will provide unique potential habitat in this area. 	<ul style="list-style-type: none"> The impact area is characterized as densely populated within 3 km (> 65%). Dispersion and ventilation are good - flat terrain and coastal wind exposure. Site is in a non-attainment area for CO.
BOS-25 City of Boston (Spectacle Island)	<ul style="list-style-type: none"> Soil characteristics have not been determined. Topography is somewhat complex. Site is an abandoned landfill, likely on-site contamination. 	<ul style="list-style-type: none"> There are no significant sensitive receptors within 1 km - surrounded by Boston Harbor. Logan air traffic is a major noise source. 	<ul style="list-style-type: none"> Current land use is abandoned industrial. The site is zoned 100% abandoned industrial. 	<ul style="list-style-type: none"> There are 2 historical register/or archeological properties on-site. 	<ul style="list-style-type: none"> There is no train or road access - only water access. 	<ul style="list-style-type: none"> There is no surface water on site. Site surrounded by Boston Harbor. 10% of the site is within a 100 year flood plain. Water quality classification is SB - saline. 	<ul style="list-style-type: none"> Area unmapped. Potential for fresh water aquifer of low to average yield. There are no wells within 2 km of the site. 	<ul style="list-style-type: none"> There are no wetlands on-site. Island has tidal mud flats surrounding it. 	<ul style="list-style-type: none"> There is one threatened and endangered species listed within 1 km of the site. Site is disturbed abandoned industrial land. 	<ul style="list-style-type: none"> Site has good ventilation. Site is in a non-attainment area for CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
LYN-02 City of Lynn	<ul style="list-style-type: none">The site is mostly disturbed terrain with no significant slope variations.There is a waste disposal treatment facility in the area and an abandoned landfill on-site. There is potential for on-site contamination.	<ul style="list-style-type: none">The site is very well buffered by the Lynn Harbor to the east end south. North and west are industrial/commercial activity along Rt. 1A.There is a significant amount of background noise from traffic on Rt. 1A and associated noise from industry and commercial business activity in the area.	<ul style="list-style-type: none">The site is currently not in use. An abandoned landfill and open land currently occupy the site.The surrounding area is industrial and commercial activity.Site is zoned 100% industrial.	<ul style="list-style-type: none">There are no historical register or archeological properties on-site or within 1 km.	<ul style="list-style-type: none">There is rail access approximately 400 meter NW of the site.There is coastal access to the site.Road access is directly off Rt. 1A down an industrial service road.	<ul style="list-style-type: none">The site sits on the Lynn Harbor.Site is covered 25% by a 100 year flood plain.Water quality classification is SB - saline.	<ul style="list-style-type: none">There is a low yield aquifer under 100% of the site.Yield potential is <100 gal/min.There are no wells within 2 km of the site.	<ul style="list-style-type: none">There is a corridor strip of wetlands which bisects the site.Wetlands abutt site borders.	<ul style="list-style-type: none">There are no threatened or endangered species noted on the site or within 1 km of the site.There are some residential concerns north on Rt. 1A but they are well buffered from site.The terrain is generally flat and coastal creating good ventilation potential.Site is in a non-attainment area for TSP.	
BOS-26 City of Boston (Deer Island)	<ul style="list-style-type: none">Soils are generally favorable-sandy loam.Topography is not complex.There is already a sewage disposal facility on the island.	<ul style="list-style-type: none">Town of Winthrop residential communities abutt the site to the north.There is considerable noise from Logan Airport.	<ul style="list-style-type: none">Current site use is a sewage treatment facility and the Deer Island House of Correction.The island is connected to the mainland through the town of Winthrop. The other three sides abutt Boston Harbor.The site is zoned 100% commercial.	<ul style="list-style-type: none">There are no historical register or archeological properties on the site.Several historical register properties eligible for nomination on site.	<ul style="list-style-type: none">There is no rail access.Coastal access is an option.Road access would be through residential streets of Winthrop.	<ul style="list-style-type: none">There is no surface water on-site. Surrounded by Boston Harbor except to the north.The site is ±5% in a 100 year flood plain.Water quality classification is SB - saline.	<ul style="list-style-type: none">Area unmapped. Potential for fresh water aquifer of low to average yield.There are no wells within 2 km.	<ul style="list-style-type: none">There are minimal wetlands on site - however there are significant tidal mud flats surrounding the site.Site is completely developed.	<ul style="list-style-type: none">There is one threatened and endangered species listed within 1 km of the site.Site is completely developed.	<ul style="list-style-type: none">Site is on the coast and has good ventilation.Site is in a non-attainment area for CO.
SOM-02 City of Somerville	<ul style="list-style-type: none">Site soil is poor - wet substratum.Flat topography.Hazardous waste site under investigation on-site - potential for on-site contamination.	<ul style="list-style-type: none">Highway and Mystic River buffer site to the west. Residences to the east are buffered by commercial/industrial activity.North of the site-residences are not buffered.Major noise sources: Rt. 16 and Rt. 93, commercial and light industrial activity in the area.	<ul style="list-style-type: none">Site is currently the Mystic River Reservation recreation area.Land use to the west is the Mystic River and Rt. 93. East of the site is Rt. 16 and commercial-light industrial use.North of the site is residential and industrial and south is the Mystic River and Rt. 28.	<ul style="list-style-type: none">There is one historical register or archeological property on site and one within 1 km.Site has minimal potential for additional cultural resources - site is largely disturbed land.	<ul style="list-style-type: none">There is rail access within 1/2 km of the site.Coastal access is a potential. Difficult access through locks and some dredging necessary.Road access is excellent off Rts. 93, 16 or 38. Some minor road deficiencies and peak hour traffic congestion problems.	<ul style="list-style-type: none">Site abutts Mystic River on two sides.80% of the site is in a 100 year flood plain.Water quality classification is SB-saline.	<ul style="list-style-type: none">Site is underlain 100% by a low yield aquifer.Well yield potential is <100 gal/min.There are no wells within 2 km of the site.	<ul style="list-style-type: none">There are no on-site wetlands.There are no off-site wetlands within 100 m.	<ul style="list-style-type: none">There are no threatened or endangered species within 1 km of the site.The site provides unique habitat for wildlife in this densely developed area.	<ul style="list-style-type: none">Impact area is largely residential within 3 km: ±80%.Terrain is flat and adequate ventilation exists.Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
QUI-09 City of Quincy	<ul style="list-style-type: none"> Soils are poor-urban land, wet substratum. Eastern 1/2 of island is dominated by a slope with \pm 40% slopes. There is a sewage disposal facility on-site. Potential for on-site contamination. 	<ul style="list-style-type: none"> Because of its harbor location, the site is well buffered from other sensitive land uses. There are no major noise sources in the area. Some noise from Logan air traffic. 	<ul style="list-style-type: none"> Current site use on Moon Island is Boston Fire and Police Dept. practice courses and firing range. Neighboring land use is Boston Harbor - good buffer. Site is zoned 100% residential. 	<ul style="list-style-type: none"> There are no historical register or archaeological properties on-site or within 1 km of the site. Site is disturbed - no indication of additional cultural resources on-site. 	<ul style="list-style-type: none"> There is no rail access within 1 km of the site. Coastal access is possible but no port area is established. Road access is very limited although residential area in Squantum and across Long Island viaduct. 	<ul style="list-style-type: none"> Site is surrounded by Boston Harbor. Site is not in a 100 year flood plain. Water quality classification is SB-saline. 	<ul style="list-style-type: none"> Area not mapped. Potential for fresh water aquifer of low to medium yield. There are no wells within 2 km of the site. 	<ul style="list-style-type: none"> There are no wetlands on-site. Surrounding the site are tidal (mud) flats. 	<ul style="list-style-type: none"> There are no threatened or endangered species within 1 km of the site. There is exceptional fishing off the north end of the island and offers habitat to harbor birds. 	<ul style="list-style-type: none"> Impact area is mostly Boston Harbor with <5% residential within 3 km. Ventilation is good. Site is in a non-attainment area for both TSP and CO.
MUL-01 Town of Hull	<ul style="list-style-type: none"> Soils on the site are dominated by a silty loam, dunes, and tidal marsh. Topography is irregular with steep hills at the east and west ends of the island. There is no indication for on-site contamination. 	<ul style="list-style-type: none"> Site has seasonal residential inhabitants. Hull Bay buffers residences to the east in Hull. There are no major noise sources on the island. 	<ul style="list-style-type: none"> Current site use is restoration of historical use and recreational facilities. Neighboring land use are Harbor Waters and residential on Hull. Island is zoned 95% residential and 5% commercial. 	<ul style="list-style-type: none"> There are 6 historical register and archaeological properties on-site. Significant archaeological findings on-site. 	<ul style="list-style-type: none"> There is no rail access. Coastal access is possible. No good pier facilities established. Road access is not available. 	<ul style="list-style-type: none"> Site is surrounded by the Boston Harbor. 30% of the site is part of a 100 year flood plain. Water quality classification is SB-saline. 	<ul style="list-style-type: none"> Area not mapped. Potential for a fresh water aquifer of low to medium yield. There are no wells noted within 2 km of the site. 	<ul style="list-style-type: none"> There is a small area of wetlands on-site covering approximately 10 acres. There are off-site wetlands surrounding site - tidal, mud flats. 	<ul style="list-style-type: none"> There are no threatened or endangered species on-site. There is significant habitat on-site - in particular of interest for bird nesting. 	<ul style="list-style-type: none"> Impact area surrounding site is mostly open water with <10% residential to east. Good ventilation with some terrain considerations. Site is in an attainment area for both TSP and CO.
BOS-28 City of Boston	<ul style="list-style-type: none"> Site soils are characterized as sandy loam. Topography is variable with perimeter slopes at >10%. There is a confirmed NPDES discharge on-site. Some potential for on-site contamination. 	<ul style="list-style-type: none"> Proximity to sensitive noise receptors is limited - site surrounded by Boston Harbor. Existing noise sources include air traffic from Logan. 	<ul style="list-style-type: none"> Current site use is a private outdoor recreation center. Surrounding land-use is Boston Harbor with mainland coastal area predominantly low-intensity industrial/commercial activity. Site is zoned 100% commercial. 	<ul style="list-style-type: none"> There are six historical register or archaeological properties on-site. High probability of additional archaeological resources on-site. 	<ul style="list-style-type: none"> There is no rail or road access available to the site. Coastal access is available. 	<ul style="list-style-type: none"> Site is surrounded by the Boston Harbor. 50% of the site is covered by a 100 year flood plain. Water quality classification is SB-saline. 	<ul style="list-style-type: none"> Area not mapped potential for a fresh water aquifer of low to medium yield. There are no wells within 2 km of the site. 	<ul style="list-style-type: none"> There are approximately 50 acres of wetlands on site. Site is surrounded by tidal mud flats and salt marshes. 	<ul style="list-style-type: none"> There are registered threatened and endangered species on the island. Island offers significant and unique habitat for both flora and fauna. 	<ul style="list-style-type: none"> Impact area surrounding the site is mostly open water or light-industrial/commercial activity along the coast. The terrain is moderately complex in areas with excellent ventilation. Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
BOS-27 City of Boston	<ul style="list-style-type: none"> Soils are predominantly sandy loam and beaches. Topography is not complicated. 	<ul style="list-style-type: none"> Lovell's Island is < 1/2 km away from Fort Warren on Georges Island. Major noise sources are non-existent. 	<ul style="list-style-type: none"> Current site use is recreational - mostly undeveloped. Neighboring land use is Boston Harbor and other Harbor Islands. Fort Warren, a major Harbor tourist attraction, is < 1/2 km south. 	<ul style="list-style-type: none"> There are no historical register or archeological properties on-site. Fort Warren, an historical register site, is < 1/2 km south. 	<ul style="list-style-type: none"> There is no rail or road access to the site. Water access is an option - however, there is no deep sea access established to the island pier. 	<ul style="list-style-type: none"> Site is surrounded by Boston Harbor. 30% of the site is in a 100 year flood plain. Water quality classification is SB - saline. 	<ul style="list-style-type: none"> Area not mapped. Potential for a fresh water aquifer of low to medium yield. There are no wells noted within 2 km of the site. 	<ul style="list-style-type: none"> 20% of site is covered by a salt marsh. There are tidal mud flats surrounding the site. 	<ul style="list-style-type: none"> There are 2 threatened and endangered species noted within 1 km of the site. Island offers unique habitat for potential rare species habitat. 	<ul style="list-style-type: none"> Impact area is mostly open harbor waters. Fort Warren is < 1/2 km south (tourist attraction). Topography is not complex and ventilation is good. Site is in a non-attainment area for CO.
WIL-08/09 Town of Wilmington	<ul style="list-style-type: none"> Soils are generally favorable-fine textured inorganic soils. Topography is moderately complex. There is some possibility for on-site contamination - there is a varified surface impoundment <200 m south. 	<ul style="list-style-type: none"> Sensitive receptors include sparse residential along Woburn St. This is well buffered by intervening forested land and an industrial park. Noise sources in the area include truck traffic on Ballardvale Rd. and intense ongoing development activity in the area. 	<ul style="list-style-type: none"> Currently site is undeveloped and forested Surrounding site is an active industrial park development. The site is zoned 90% residential and 10% industrial. 	<ul style="list-style-type: none"> There are no historical register or archeological properties within 1 km. 	<ul style="list-style-type: none"> Transportation is Rt. 125 east off Rt. 93 for 1 km and north on Andover Road to site. The closest rail access is ±1/2 km west. 	<ul style="list-style-type: none"> There is a small stream which traverses the site. Site is not within a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> 75% of site is underlain by no aquifer and 25% by a low yield (L₁) aquifer. Well yield potential is 75% negligible with 25% at <5 gal/min. The closest active well is >1 1/2 km away. 	<ul style="list-style-type: none"> Wetlands cover <10% of site. There are small areas of wetlands scattered in general area. 	<ul style="list-style-type: none"> There are no threatened or endangered species within 1 km of site. 1/2 of the site is undeveloped, forest land offers potential for wildlife habitat. 	<ul style="list-style-type: none"> Surrounding area is dense with industrial and commercial activity. Sparse residential areas north on Andover St. Terrain is gently rolling with good ventilation. Area is an attainment area for both TSP and CO.
STO-06 Town of Stoughton	<ul style="list-style-type: none"> Soils are generally poor in this area - coarse texture. Topography is somewhat irregular. Depth to bedrock is shallow due to on-site quarry activity. 	<ul style="list-style-type: none"> There are residences ±1/2 km south of the site and are separate from site by a new warehouse development. There are some spotted residences abutting site to the north and on Turnpike St. to the west. Major noise sources in the area include Rt. 24 abutting to the east, quarry/asphalt operation west of site, construction and light industrial/warehouse activity in area. 	<ul style="list-style-type: none"> Current site use is undeveloped - northern end there is a power line running E-W and abandoned trash. Surrounding use is industrial warehousing and quarry with sparse residential. Site is zoned 100% industrial. 	<ul style="list-style-type: none"> There are no historical register or archeological properties within 1 km of site. 	<ul style="list-style-type: none"> There is no rail within 1 km. The closest rail is ±3 miles NE off site and is inactive. Road access is Rt 139 exit south off Rt 24 - approx. 1 km. Road is travelled by trucks associated with other industrial activity in the area. 	<ul style="list-style-type: none"> Approximately 3 km south of the site is Beaver Brook. Site is not within a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> 90% of the site is underlain by no aquifer and 10% by a low yield (L) aquifer. Aquifer yield is negligible at <5 gal/min. Closest active well is >1.5 km NW of site. 	<ul style="list-style-type: none"> Wetlands on site comprise <5%. The closest wetland is <1/2 km away but is separate from site by Rt. 24. 	<ul style="list-style-type: none"> There is one threatened and endangered fauna species noted within 1 km of the site. Site is mostly disturbed land but southern 1/2 has suitable wildlife habitat. 	<ul style="list-style-type: none"> General area is sparsely residential. Topography is gently rolling and has good ventilation. Area is an attainment area for both TSP and CO. There is a significant amount of additional industrial activity in the area.

DESCRIPTION OF RECOMMENDED SITES (Continued)

<u>Site ID</u>	<u>Engineering Consideration</u>	<u>Noise Environment</u>	<u>Land Use</u>	<u>Cultural Resources</u>	<u>Transportation</u>	<u>Surface Water</u>	<u>Ground Water</u>	<u>Wetlands</u>	<u>Ecology</u>	<u>Air Quality</u>
WLP-07 Town of Walpole	<ul style="list-style-type: none"> o Soils characteristic-ally dominated by fine textured inorganic soils - sandy loam. o The perimeter of the site is steep: >10% slope. Site is elevated relative to surrounding land. o Noted potential of existing on-site contamination from an abandoned land-fill and previous industrial activity on Bird Pond. 	<ul style="list-style-type: none"> o There are dense residential communities north and east of the site. East is mixed with commercial. Southern 1/2 off site are abandoned industrial facilities. o Surrounding noise sources are minimal - traffic on Washington St. and Mylod St. 	<ul style="list-style-type: none"> o Northern 1/2 undeveloped, forested land. Southern 1/2-abandoned light-industrial land for sale with an office building. o Neighboring land use to the south is an abandoned industrial facility. To the north of site is residential on Mylod St. Washington St., to the east, is mixed residential and commercial. West of the site is undeveloped forested land. o Site is zoned 100% industrial. 	<ul style="list-style-type: none"> o There are 15 historical register or archeological properties within a 1 km radius of the site. 	<ul style="list-style-type: none"> o Rail access is 1/8 km south of the site. o Road access off Rt. 1 south to High Plain St. west to Washington St. north to site. Washington St. is a 2-lane arterial road servicing residential, commercial and light industrial traffic. 	<ul style="list-style-type: none"> o Site abuts Bird Pond to the south. o The site is not within the 100 year flood plain but abuts the flood plain associated with Bird Pond to the south. o Water quality classification is B. 	<ul style="list-style-type: none"> o The site is underlain 100% by no aquifer and no wells are on site. o Aquifer yield is <5 gal/min. o There are no drinking wells within 2 km of site. 	<ul style="list-style-type: none"> o There are no wetlands on-site. o The closest wetland is >100 m south off-site. 	<ul style="list-style-type: none"> o There are no threatened or endangered species noted within 1 km of the site. o The northern 1/3 of the site is an undeveloped forested area. There is some potential for wildlife habitat on-site. 	<ul style="list-style-type: none"> o 60% of the surrounding land use is residential. o Topography is gently rolling and in general has good ventilation. o The site is in an attainment area for both TSP and CO.
BUR-03 Town of Burlington	<ul style="list-style-type: none"> o Soils characterized as sandy loam. o Portions of site have complex topography with slopes >20%. o Low potential for on-site contamination. 	<ul style="list-style-type: none"> o Residences abut site along western border. o Existing major noise sources are Rt. 128 and Rt. 3 abutting site to the south and east. 	<ul style="list-style-type: none"> o Site is currently not in use except for a power line ROW which bisects the site. o Surrounding land use to the east are Rt. 3 and an industrial park. To the west is residential. North of the site is undeveloped and industry. South of the site is Rt. 128. o Site is zoned 100% industrial. 	<ul style="list-style-type: none"> o There are no historical register or archeological properties on site or within 1 km. o Site is undeveloped. Minimal probability that cultural resources will be identified on the site. 	<ul style="list-style-type: none"> o There is no rail or water access to the site. o Road access off Rt. 128 or Rt. 3 through residential areas to site. 	<ul style="list-style-type: none"> o Surface water bodies on site comprise < 5% of area. o 5% of site is in a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 100% by no aquifer with negligible yield potential. o There are no wells on site. The closest wells are 750 m east of the site. 	<ul style="list-style-type: none"> o Approximately 10% of site is covered by wetlands. o Wetlands abut site to the west along a stream. 	<ul style="list-style-type: none"> o There are no threatened or endangered species within 1 km of the site. o Site is undeveloped and forested - it offers potential habitat for wildlife. 	<ul style="list-style-type: none"> o Surrounding impact area characteristics are \pm 60% residential. o Terrain is not complex in the area and ventilation is good. o Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
WES-02 Town of Westwood	<ul style="list-style-type: none"> o Soils dominated by sandy loam textures. o Outcrops noted on site and topography is complex in areas. 	<ul style="list-style-type: none"> o Residences abutt site to the southwest and south. o Existing major noise sources are traffic on Rt. 128 to the north and Rt. 109 to the west. 	<ul style="list-style-type: none"> o Current site use is undeveloped and forested. o Neighboring land use to the south, southeast, and opposite Rt. 109 to the west is residential. Rt. 128 is to the north. o Site is zoned 15% residential and 85% administrative - research office. 	<ul style="list-style-type: none"> o There are 3 historical register or archeological properties within 1 km of the site. o Site is undeveloped but not likely to yield additional cultural resources 	<ul style="list-style-type: none"> o There is no rail or water access to site. o Road access is excellent of Rt. 128 onto Rt. 109 to the site. 	<ul style="list-style-type: none"> o There is a small stream comprising <5% of site. o None of the site is within a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 100% by no aquifer. o Well yield potential for site is approx. 5 gal/min. o There are no wells on site and the closest wells are 750 m SW. 	<ul style="list-style-type: none"> o Less than 10% of the site is covered by wetlands. o Wetlands abutt the site to the SE. 	<ul style="list-style-type: none"> o There are no threatened or endangered species within 1 km of the site. o Site is undeveloped and forested and offers potential wildlife habitat. 	<ul style="list-style-type: none"> o Dispersion area characteristics include + 25% residential within 3 km. o Terrain is not complex in the area and ventilation is good. o Site is in an attainment area for both TSP and CO.
WLP-13/15 Town of Walpole	<ul style="list-style-type: none"> o Soils are medium textured sandy loam. o Topography is moderately complex. o There is no indication of any potential on-site contamination. 	<ul style="list-style-type: none"> o North and south of the site are new housing developments (which are separated by +300 m of forested land from the site). West of the site is undeveloped forested land. East on North St. is sparse residential farmland. The Norfolk Co. Ecological Laboratory is contiguous to the NE corner of the site. o There are no significant existing noise sources. 	<ul style="list-style-type: none"> o Current site use is partially cleared and forested land. o A power line traverses the site NE to SW. o There are plans for more housing development north and south of the site. o Site is zoned 100% rural. 	<ul style="list-style-type: none"> o There is one historical register or archeological property noted within 1 km of the site. 	<ul style="list-style-type: none"> o There is no rail access in the vicinity. o Road access is provided by Route 109. On-site access road would have to be established. 	<ul style="list-style-type: none"> o There are on-site water bodies covering <10%. o The site is not within a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o The site is underlain 100% by a low yield aquifer. o Well yield potential is <100 gal/min. o There are four active wells between 1000-1500 m from the site. 	<ul style="list-style-type: none"> o Site is bisected by wetlands covering approximately 20% of the site. 	<ul style="list-style-type: none"> o There are no threatened or endangered species noted within 1 km of the site. 	<ul style="list-style-type: none"> o The impact area around the site (3 km) is mostly undeveloped forested or farmed land. (10-15% residential). o The terrain is gently rolling with a slight rise in elevation west of the site. o Site is in an attainment area for both TSP & CO.
WLP-14 Town of Walpole	<ul style="list-style-type: none"> o 90% of site soils are classified as muck. o Site topography is essentially flat. o On site contamination likely - identified on-site surface impoundment. 	<ul style="list-style-type: none"> o Residences abutt site to the south. Sparse residences along NW border the site. o Existing major noise includes local traffic, mixed industrial/commercial activity to the W and E, and railroad traffic. 	<ul style="list-style-type: none"> o Current site use is undeveloped and forested. Two rail spurs, a pipeline, and a power line bisect the site. o Land-use to the E and W is vacant land for +300 m to residential mixed with commercial and industrial. South is mostly residential. W of the site is wetlands out 100-500m to residential. 	<ul style="list-style-type: none"> o There is one historical register or archeological property within 1 km of the site. o Site is undeveloped and there is a possibility of additional on-site cultural resources. 	<ul style="list-style-type: none"> o There is on-site rail access and the line is active. o Site access off Rt. 1 through residential areas. 	<ul style="list-style-type: none"> o <5% of site is covered by a surface water body. o 90% of the site is covered by a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 75% by no aquifer, 20% by a medium yield and 5% by a high yield aquifer. o Well yield potential is averaged to a medium yield of 100-300 gal/min. o There are no wells on-site. Off-site wells are >750 m NE. 	<ul style="list-style-type: none"> o Approx. 75% of site is covered by wetlands. o Wetlands abutt site to the east and west. 	<ul style="list-style-type: none"> o There are no threatened or endangered species within 1 km of the site. o Site is Cedar Swamp and offers potential for wildlife habitat. 	<ul style="list-style-type: none"> o Surrounding impact area is characterized by <20% residential. o Terrain is flat and ventilation is good. o Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
HLB-11 Town of Holbrook	<ul style="list-style-type: none"> o Soils are characterized as sandy loam. o Topography is reasonably flat and depth to bedrock is 72 m. o No indication for any on-site contamination concerns. 	<ul style="list-style-type: none"> o Residences abutt site to the N and W. o Existing noise source is local traffic on Rt. 139. 	<ul style="list-style-type: none"> o Current site use is undeveloped, forested land with a power line bisecting the site. o Neighboring land use to the N and W is residential. To the E and S is wetlands and forest. o Site is zoned 100% residential. 	<ul style="list-style-type: none"> o There are 4 historical register or archeological properties within 1 km of the site. o Site is undeveloped and it is possible that additional archeological resources exist on site. 	<ul style="list-style-type: none"> o There is no rail or coastal access to the site. o Road access off Rt. 139 which has significant residential developments. 	<ul style="list-style-type: none"> o There is no surface water bodies on site. o Weymouth water supply is < 1 km E of the site. o None of the site is on a 100 year flood plain. o Water quality classification is A. 	<ul style="list-style-type: none"> o Site is underlain 100% by no aquifer. o Well yield potential is < 5 gal/min. o There are no wells on site and none within 2 km of the site. 	<ul style="list-style-type: none"> o < 10% of the site is covered by wetlands. o Wetlands abutt site to the N, E, and S. 	<ul style="list-style-type: none"> o There are no threatened or endangered species within 1 km of the site. o Site is wetlands and wooded. On-site potential wildlife habitat exists. 	<ul style="list-style-type: none"> o Impact area is characterized by <20% residential within 3 km. o Topography is not complex in the area and ventilation is good. o Site is in an attainment area for TSP and CO.
ASH-18/22 Towns of Ashland and Framingham	<ul style="list-style-type: none"> o Soils are medium textured silty and sandy loam. o Topography is gently rolling. o The northwestern 1/4 of the site is part of an EPA 21E site - on-site contamination confirmed. 	<ul style="list-style-type: none"> o The Ashland Jr. High School is located roughly 200 m to the east. Residences surrounding the site are sparse. o Existing noise sources are traffic noise from Rt. 135 north of the site and an active rail line. 	<ul style="list-style-type: none"> o Currently the site is undeveloped and forested. o Northeast of the site is industry. North of the site is commercial mixed with residential. East, west and south of the site are sparsely populated. o Site is zoned 50% industrial (north) and 50% residential (south). 	<ul style="list-style-type: none"> o There are two historical register or archeological properties off site within 1 km. 	<ul style="list-style-type: none"> o There is rail access abutting the site to the north. o Road access is off Rt. 135 onto a town road for on-site access. 	<ul style="list-style-type: none"> o The site is <100 m from the Sudbury River. o Site is not in a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o The site is partially (10%) underlain by a medium yield aquifer. o Yield potential for this portion of the site is 100-300 gal/min. The rest of this is negligible yield. <p>There are 4 wells noted within 1 km but they are all listed as contaminated.</p>	<ul style="list-style-type: none"> o Along the northern border of the site is a small stretch of wetlands. 	<ul style="list-style-type: none"> o There are no threatened or endangered species within 1 km of the site. o Because the site is undeveloped and forested - there is some potential habitat potential. 	<ul style="list-style-type: none"> o The 3 km surrounding impact area is mostly open land: 15% residential, and 5% industrial. o The terrain is moderately complex with some potential ventilation problems. o The site is in an attainment area for both CO and TSP.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
ASH-20 Town of Shland	<ul style="list-style-type: none"> Site soils are characterized as mostly silty loam. Topography of site is a gradually sloping hill. There is no indication of potential for on-site contamination. 	<ul style="list-style-type: none"> Site is well buffered from sensitive noise receptors. Apartment complex ± 200 m west of site. There are essentially no major noise sources in the area. 	<ul style="list-style-type: none"> Current site use is undeveloped woodland. Neighboring land use is mostly undeveloped woodland with sparse residential. 	<ul style="list-style-type: none"> There are no historical register or archeological properties on-site or within 1 km. Site is undeveloped and there is potential for additional cultural resources on the site. 	<ul style="list-style-type: none"> There is neither water nor rail service for the site. Road access is good off Rt. 90 to Oak St. (which is a residential st.) There is no direct on-site road access established. 	<ul style="list-style-type: none"> There are no surface water bodies on-site nor within 100 m of site. None of the site is on a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> Site is underlain 100% by no aquifer. Well yield potential is < 5 gal/min. There are no wells on-site and none within 1 km of the site. 	<ul style="list-style-type: none"> $< 5\%$ of the site is wetlands. Off-site wetlands abut the site to the N. 	<ul style="list-style-type: none"> There are no threatened or endangered species within 1 km of the site. Site is undeveloped land with adequate habitat for wildlife. 	<ul style="list-style-type: none"> Impact area is characterized by $\pm 30\%$ residential within 3 km. Topography in area is not complex and ventilation is good. Site is in an attainment area for TSP and CO.
LB-13 Town of Holbrook	<ul style="list-style-type: none"> Soils are characterized as stony, sandy loam. Topography at eastern 1/3 is moderately jumbled. Depth to bedrock averages 2-10 m over most of the site. There is no indication for any potential on-site contamination. 	<ul style="list-style-type: none"> Residences abut site to the west. Ames Nowell State Park is south of the site. Existing major noise sources include local traffic, Rt. 139, and Weymouth Air Station air traffic. 	<ul style="list-style-type: none"> Current site use is undeveloped, forested land. Holbrook Sportmen's Club Rifle Range is on site. Power line cuts across eastern edge of site. Neighboring land use to the E & W is open land out to 139 (industrial); to the S is Ames Nowell State Park and to the W is residential. 	<ul style="list-style-type: none"> There are no historical register or archeological properties on site; there are 3 within 1 km. There is a strong possibility of additional archeological resources on site. 	<ul style="list-style-type: none"> No rail or water access exists for site. Road access is off Rt. 139. Rt. 139 passes through residential areas. No actual road to get on-site currently exists. 	<ul style="list-style-type: none"> $< 5\%$ of site is covered by surface water. Site is not within a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> Site is underlain 100% by no aquifer. Well yield potential is < 5 gal/min. There are no wells on-site or within 1 km of the site. 	<ul style="list-style-type: none"> $< 10\%$ of site is covered by wetlands. Wetlands abut site to the N, E and S. 	<ul style="list-style-type: none"> There are no threatened or endangered species on site or within 1 km of site. Appropriate potential habitat does exist on this site. 	<ul style="list-style-type: none"> 3 km impact area is characterized by $< 15\%$ residential. Topography is not complex in this area and ventilation is good. Site is in an attainment area for both TSP and CO.
LP-08 Town of Walpole	<ul style="list-style-type: none"> Soils are predominantly fine textured inorganic. Site slopes gently to the north. There is no indication of on-site contamination. 	<ul style="list-style-type: none"> Site is contiguous to the Walpole MCI facility to the south. There are sparse residences to the east and to the north. There is consistent noise associated with the prison and traffic on Rt. 1A. 	<ul style="list-style-type: none"> Current site use is undeveloped partially forested and cleared land. The surrounding land use includes the prison to the south, residences & a dog kennel to the north, open land to the west and residences to the east. The site is zoned 100% rural. 	<ul style="list-style-type: none"> There are 2 historical register or archeological properties within 1 km of the site. 	<ul style="list-style-type: none"> Rail access is 300 m east. Road access off Rt. 1A north which has peak hour traffic congestion problems. 	<ul style="list-style-type: none"> There are several small ponds abutting the site. $< 5\%$ of the site is in a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> There is no aquifer underlying the site. Well yield potential on-site is < 5 gal/min. The closest wells are > 1 km from the site. 	<ul style="list-style-type: none"> Wetlands abut the site to the north. 	<ul style="list-style-type: none"> There are no threatened or endangered species within 1 km of the site. The site is suitable habitat for wildlife. 	<ul style="list-style-type: none"> Impact area is characterized as light density residential. The prison is slightly elevated relative to the site. Ventilation in the area is generally good. The site is in an attainment area for both CO and TSP.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
MAL-01 Town of Malden	<ul style="list-style-type: none"> This site is a quarry. Steep walls surround on 3 sides of the site 4th side is open at ground level. Bedrock is exposed over a considerable portion of the site. 	<ul style="list-style-type: none"> Residential areas are to the north and east. Rt. 1 abutts the site to the west. South of the site is mixed residential/commercial. Rt 1 is a major noise source. 	<ul style="list-style-type: none"> The quarry is an active on-site operation. The surrounding area is residential mixed with commercial. Site is zoned 100% highway business. 	<ul style="list-style-type: none"> There are 2 historical register or archeological properties within 1 km off-site. 	<ul style="list-style-type: none"> There is no water access to the site. Rail access is approximately 400 m southeast of the site. Road access is off Rt. 1 on Salem St. to access site through quarry entrance. 	<ul style="list-style-type: none"> There are no surface water bodies within 100 m of the site. The quarry is not within a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> There is no aquifer underlying this site. There are no wells noted within 2 km of the site. 	<ul style="list-style-type: none"> There is a very small (± 2 acre) wetland on the site. There is a small area of wetlands contiguous to the north of the site. 	<ul style="list-style-type: none"> There are no threatened or endangered species within 1 km of the site. 	<ul style="list-style-type: none"> Surrounding impact area within 3 km is $\pm 50\%$ residential and $\pm 20\%$ commercial/industrial. Quarry is low lying with the eastern end open at ground level. Ventilation is a potential concern. Site is in an attainment area for both CO and TSP.
BED-09 Town of Bedford	<ul style="list-style-type: none"> Soils are typically medium textured inorganic. The site is topographically lower than the area immediately to the north. There is no indication for on-site contamination. 	<ul style="list-style-type: none"> The Marist Seminary and Middlesex Community College North campus abutts the site to the north. There is a new housing development SE of the site. There are no significant noise sources other than traffic noises from Rt. 3. 	<ul style="list-style-type: none"> Current site use is recreational purposes associated with the Community College. The site is forested. The contiguous land use is residential except the College campus north of the site and some commercial-industrial facilities north of the site. Site zoned 100% residential. 	<ul style="list-style-type: none"> There are no historical register or archeological properties within 1 km of the site. 	<ul style="list-style-type: none"> There is no rail access within 1 km. Road access is off Rt. 3 on Concord St. to Springa Rd. There is minor truck traffic on these roads. 	<ul style="list-style-type: none"> A small stream cuts across the NE corner of the site. The site is not in a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> There is no aquifer underlying this site. The closest well is >1700 m west. 	<ul style="list-style-type: none"> There are wetlands at the northern end of the site. Wetlands lie along the eastern edge of site. 	<ul style="list-style-type: none"> There are no threatened or endangered species noted within 1 km of the site. There is potential habitat on the site which is largely forested and undisturbed. 	<ul style="list-style-type: none"> The Middlesex Community College and Marist Seminary abutts the site to the north. Residences are mostly south and southeast of the site. There is little industrial or commercial activity within 1 km of the site. Because the site is significantly lower topographically relative to the area to the north - there are potential ventilation problems. Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
WOB-10 City of Woburn	<ul style="list-style-type: none"> Soils are characterized as mostly sandy loam - some muck and outcrop. Depth to bedrock is variable: ± 2 m. Eastern side of site is a slope $> 15\%$. 	<ul style="list-style-type: none"> Northeastern Univ. Campus is north of the site, residences to the S and W and sparse residences to the east. Existing noise source is local traffic. 	<ul style="list-style-type: none"> Current site use is open, forested land with a water tank in the center of the site. Neighboring land use to the N is Northeastern Univ. campus, residential to the W and S and mixed residential/commercial to the E. Site is zoned 100% residential. 	<ul style="list-style-type: none"> There are no historical register or archeological properties on site or within 1 km. There is marginal probability of additional cultural resources on site. 	<ul style="list-style-type: none"> There is no water or rail access to the site. Road access is through residential areas on a two-lane road. 	<ul style="list-style-type: none"> There is a pond on site covering $< 5\%$ of the site. Site is not within a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> Site is underlain 100% by no aquifer. Well yield potential is negligible. There are no wells on site and none within 1 km. 	<ul style="list-style-type: none"> Wetlands on site cover $< 25\%$ of the site. Wetlands abut the site to the N and W. 	<ul style="list-style-type: none"> There are no threatened or endangered species on site or within 1 km. Site offers suitable habitat for wildlife. 	<ul style="list-style-type: none"> Impact area characteristics within 3 km is $\pm 45\%$ residential. Terrain is not complex within 3 km and ventilation is good. Site is in an attainment area for both TSP and CO.
STO-08 Town of Stoughton	<ul style="list-style-type: none"> Base soil characteristics were not determined. Topography is jumbled throughout site. Depth to bedrock is averaged at ± 2 m. There is no indication of on-site contamination. 	<ul style="list-style-type: none"> Sparse residential areas abut the site to the N, E, and W. Existing noise sources are local traffic and Rt. 138. 	<ul style="list-style-type: none"> Current site use is mostly forested undeveloped land. NE 1/3 of site is a shooting game range. SW corner is a housing development. Surrounding land use includes open land N and S. Sparse residential to the E and W. NE corner of site is a dense pocket of residences. Site is zoned 100% residential. 	<ul style="list-style-type: none"> There is one historical register or archeological property on-site and 4 within 1 km. There is a probability of additional cultural resources on the site. 	<ul style="list-style-type: none"> Site has rail access on-site. There is no water access. Road access is directly off Rt. 138. No paved road onto site. 	<ul style="list-style-type: none"> There are surface water bodies on site comprising $< 10\%$ of site. 10% of site is in a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> Site is underlain 75% by no aquifer, 15% by a low yield aquifer, and 10% by a medium yield aquifer. Well yield potentials associated with the aquifers are: <ul style="list-style-type: none"> 75% < 5 gal/min 15% < 100 gal/min 10% 100-300 gal/min There are no wells on site and none within 1 km of the site. 	<ul style="list-style-type: none"> Wetlands cover approx. 20% of the site. Wetlands abut the site to the NE. 	<ul style="list-style-type: none"> There is one threatened and endangered species noted within 1 km of the site. Site has suitable habitat for rare species. 	<ul style="list-style-type: none"> Impact area characteristics within 3 km is $\pm 20\%$ residential. The terrain is not complex in the area and ventilation is good. Site is in an attainment area for both TSP and CO.
WED-02 Town of Needham	<ul style="list-style-type: none"> Soils are characterized as sandy loam with minor amounts of on-site bedrock outcropping. Depth to bedrock is averaged at 2-10 m. Topography complex along the perimeter. 	<ul style="list-style-type: none"> There are significant residential areas to the N and S of the site. There are no existing major noise sources. 	<ul style="list-style-type: none"> Current site use is 50% wooded and 50% cleared land. Neighboring land use includes residential to the S and NE. Babson College is to the N and NW. 	<ul style="list-style-type: none"> There are 4 on-site historical register or archeological properties. Site has medium potential for additional cultural resources. 	<ul style="list-style-type: none"> There is no rail or water access. Road access is good off Rt. 135. Rt. 135 has peak hour traffic congestion problems. 	<ul style="list-style-type: none"> There are surface water bodies within 1/2 km of the site. Site is not in a 100 year flood plain. Water quality classification is B. 	<ul style="list-style-type: none"> Site is underlain 75% by no aquifer and 25% by a low yield aquifer. Well yield potential is negligible. There is one well at 900 m NE. 	<ul style="list-style-type: none"> There are $< 5\%$ wetlands on site. Site does not abut wetlands. 	<ul style="list-style-type: none"> There are two threatened and endangered species within 1 km of the site. Site offers potential habitat for rare species. 	<ul style="list-style-type: none"> Impact area within 3 km is $\pm 45\%$ residential. Ventilation is a potential concern in this area. Site is in an attainment area for both TSP and CO.

DESCRIPTION OF RECOMMENDED SITES (Continued)

Site ID	Engineering Consideration	Noise Environment	Land Use	Cultural Resources	Transportation	Surface Water	Ground Water	Wetlands	Ecology	Air Quality
WLP-12 Town of Walpole	<ul style="list-style-type: none"> o Soils are characterized as sandy loam. o Topography is not complex. o There is no indication of potential on-site contamination. 	<ul style="list-style-type: none"> o Site is contiguous to significant residential areas to the E, W and S. o There are no existing major noise sources. 	<ul style="list-style-type: none"> o Current site use <20% agriculture and 80% wooded. o Neighboring land use is residential to the E, S and W. Some open land to the north. o Site is zoned 100% residential. 	<ul style="list-style-type: none"> o There are no historical register or archeological properties on-site. 4 are within 1 km. o Site has slight potential for additional cultural resources on-site. 	<ul style="list-style-type: none"> o There is no rail or water access. o Road access is on town roadways. o There are some design and safety concerns with area roadways. 	<ul style="list-style-type: none"> o Surface water bodies on site cover <10% of the site. o <5% of the site is covered by a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 85% by no aquifer and 15% by a low yield aquifer. o Well yield potential is negligible. o There are no wells within 1500 m of the site. 	<ul style="list-style-type: none"> o Wetlands cover <5% of the site. o Wetlands border the site. 	<ul style="list-style-type: none"> o There are no threatened or endangered species on-site or within 1 km. 	<ul style="list-style-type: none"> o Impact area within 3 km of the site is 35% residential. o Ventilation is adequate in this area. o Site is in an attainment area for both TSP and CO.
WAT-07 Town of Watick	<ul style="list-style-type: none"> o Soils are characterized as fine, sandy loam. o Topography is gently sloping to the NW. o There is no indication of potential on-site contamination. 	<ul style="list-style-type: none"> o Residences abutt the site to the N, W and S. o There are no significant noise sources in this area. 	<ul style="list-style-type: none"> o Site is mostly undeveloped agriculture with new residences at the N end of the site. o Neighboring land use is residential to the N, W and S. Pagan Hill Reservation is to the SE. o Site is zoned 100% residential. 	<ul style="list-style-type: none"> o There is one historical register or archeological property on-site and several within 1 km. o There is essentially no potential for additional cultural resources on-site. 	<ul style="list-style-type: none"> o There is no rail or coastal access to the site. o Road access is off residential roads. o There are potential safety and design concerns with roadways in the vicinity of the site. 	<ul style="list-style-type: none"> o There are water bodies on-site which cover <5% of the site. o Site is not in a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 100% by no aquifer. o Well yield potential is negligible. o There are three active wells at 625 m NE of the site. 	<ul style="list-style-type: none"> o Wetlands cover <10% of the site. o Off-site wetlands do abutt the site borders. 	<ul style="list-style-type: none"> o There is one threatened and endangered species within 1 km of the site. o Site does offer potential habitat for rare species concerns. 	<ul style="list-style-type: none"> o Impact area characteristics within 3 km of the site is 10% residential. o Ventilation is good in the area of the site. o Site is in an attainment area for both TSP and CO.
CAN-12 Town of Canton	<ul style="list-style-type: none"> o Soils are characterized as sandy loam and outcrops. o Depth to bedrock is averaged at <2 m. o Topography is not complex. 	<ul style="list-style-type: none"> o Blues Hills Reservation is to the east and residences to the west. o Existing major noise sources are Rts. 138 and 128. 	<ul style="list-style-type: none"> o Current site use is Ponkapog Golf Course. o Neighboring land use is mixed residential and commercial along Rt. 138. S and E are wooded and wetlands. W is Rt. 128. o Site is zoned 100% residential. 	<ul style="list-style-type: none"> o There are no historical register or archeological properties on-site. There are several in the vicinity. o There is strong possibility of additional cultural resources on-site. 	<ul style="list-style-type: none"> o There is no rail access within 1 km and no water access. o Road access is excellent off Rt. 128 onto Rt. 138. o Immediate area has significant peak hour traffic congestion concerns. 	<ul style="list-style-type: none"> o Surface water bodies abutt the site. o Site is not in a 100 year flood plain. o Water quality classification is B. 	<ul style="list-style-type: none"> o Site is underlain 100% by no aquifer. o Well yield potential is negligible. o There are no wells within 1500 m of the site. 	<ul style="list-style-type: none"> o There are no wetlands on site. o Wetlands abutt the site to the west. 	<ul style="list-style-type: none"> o There is one on-site threatened and endangered species and 10 additional species within 1 km of the site. o Area is highly significant habitat for rare species. 	<ul style="list-style-type: none"> o Impact area is characterized by 10% residential within 3 km. o Ventilation is good despite the moderately complex terrain to the north of the site. o Site is in an attainment area for both TSP and CO.

Appendix SP

MEPA Special Procedure



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

MICHAEL S. DUKAKIS
GOVERNOR

JAMES S. HOYTE
SECRETARY

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ESTABLISHING A SPECIAL PROCEDURE FOR A
MAJOR AND COMPLICATED PROJECT

PROJECT NAME : Residuals Management Facility Plan
PROJECT LOCATION : Statewide
EOEA NUMBER : 5832
PROJECT PROPONENT : MWRA
DATE NOTICED IN MONITOR : January 10, 1986

This project entails planning for the long term collection, processing, transportation, and disposal of residual materials (sludge, scum, grit, and screening) from MWRA wastewater treatment activities. In the EIR, the MWRA will assess these alternatives, and choose one or more for implementation.

The MWRA has requested that the project be designated as Major and Complicated under the provisions of 301 CMR 10.10. In my Certificate on the ENF, issued on February 10, 1986, I agreed to this designation. Accordingly, pursuant to the M.G.L., c.30, s.62A, I establish herewith a Special Procedure for evaluation and review of the above project.

1.0

BACKGROUND

The Residuals Management Facilities Plan (RMFP) is one of a number of related activities leading to the clean up of Boston Harbor. Following its recently completed Final EIR (EOEA #4911), the MWRA chose Deer Island as the site for a new secondary waste-

water treatment plant. Near term improvements of the treatment system are currently under way through the Fast Track Improvement Program (EOEA #5041) designed to restore the existing Deer Island and Nut Island Plants to their original functioning. The MWRA also has filed an application with the U.S. EPA to allow for an interim ocean disposal plan (EOEA #5833) to substitute deep water disposal of sludge at an existing, designated disposal site for the current discharge to Boston Harbor by 1988. By Court decree, the MWRA must have, by 1991, a viable alternative for the disposal of residuals from all of its existing facilities. Further, planning must commence for the long term disposal of the larger volumes of residuals expected when the full primary plant comes on line in 1995 and when the secondary portion of the treatment plant comes on line at the end of this century. The MWRA must develop these alternatives and complete the Residuals Management Facilities Plan by mid-1987 in order to meet these requirements.

2.0

PHASE I SUMMARY

The planning effort for long term residuals management began in mid-1985. A "Phase I Report" was provided to EOEa with the Environmental Notification Form and has been reviewed by my office, other Commonwealth agencies, Federal agencies, local communities, and citizens.

The Phase I work has yielded a solid analysis of available and potential residuals management technologies. The results indicate that fourteen process trains should be carried forward into Phase II. Grouped broadly, these comprise landfilling, composting, ocean disposal, incineration, and innovative thermal processes. Phase I also included a site screening analysis, narrowing an initial list of 200 sites to a short list of inland, coastal, and Harbor island sites for further consideration. During the ENF review, many questions were raised concerning the site screening and the resultant list.

The problem before the MWRA is one of unusual complexity. The residuals themselves are difficult to characterize and can be expected to change in both volume and quality during the planning period. Numerous technologies are available to condition, dewater, treat, and dispose of the residuals. Each technology is amenable to a broad range of mitigation measures to reduce potential impacts. Numerous sites might be found for any of the technologies. Several methods are available to transport the residuals from their point of generation to the processing and disposal sites. And each combination of residuals, transport, processing, and site leads to a unique set of potential

environmental effects. If all possible combinations of these elements were to be considered, the number of alternatives would overwhelm the analysis.

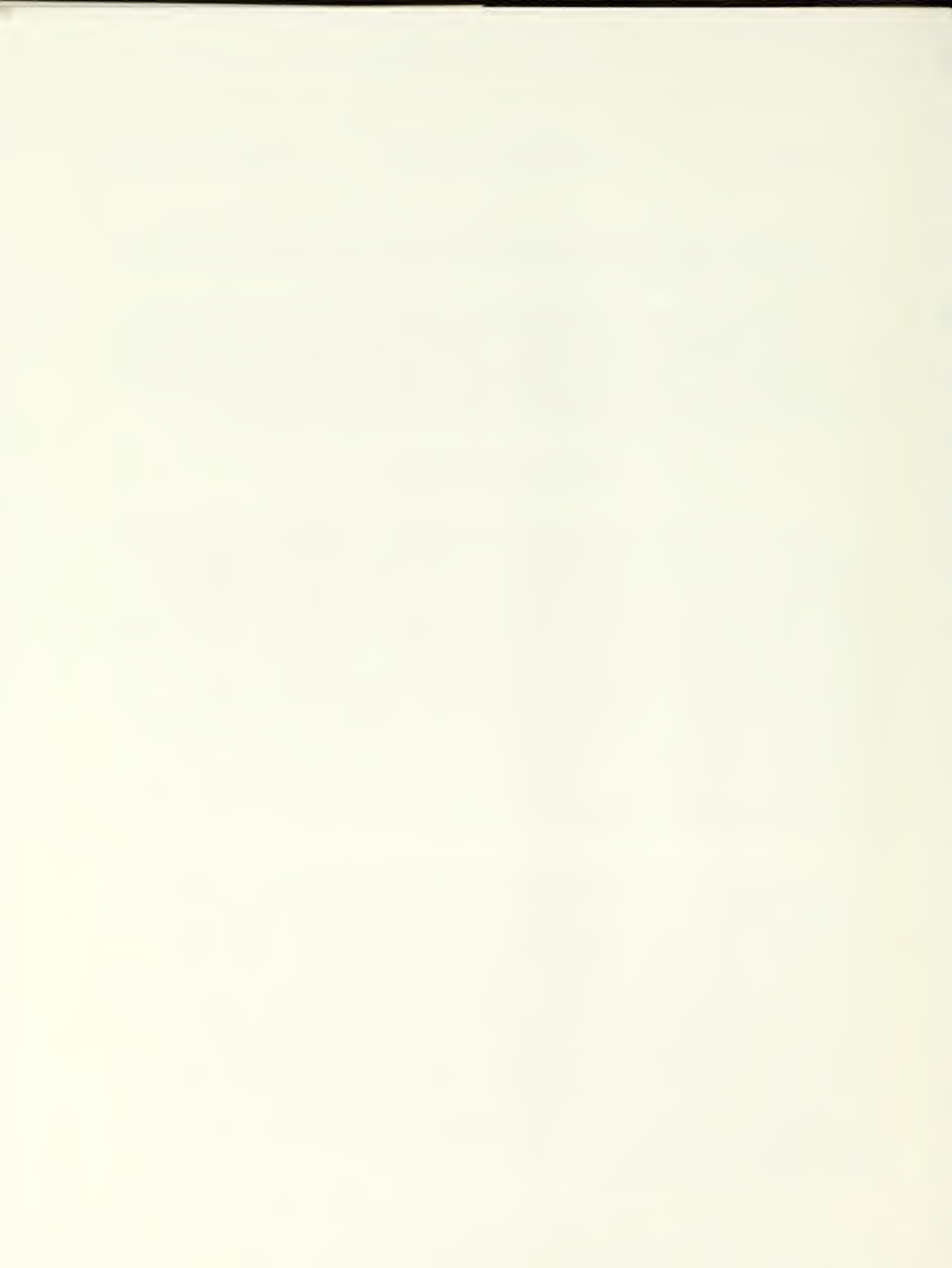
Therefore, early in the coming effort this vast number of alternatives must be reduced to a manageable number. From among this reduced universe, the best residuals management plan must then be chosen. It is the purpose of this Special Procedure to structure that process in a way that leads to a successful and timely decision and provides for periodic public review.

3.0

PHASE II OVERVIEW

In my review of the Phase I documents, I have been troubled by the early mixture of site and technology criteria, which confused the screening process for both sites and technologies. I also question the wisdom of beginning an extensive field monitoring program on the sites surviving the initial screening. This concern is reinforced by the obvious unacceptability of some sites and the contention voiced in the public hearings that superior sites were overlooked. To avoid these problems, the Special Procedure will begin with a two track process that carries technology assessment and site assessment on independent tracks for the first few months of the schedule. Technologies, mitigation strategies, sites and selection criteria will be separately reported on, followed by a merging of the dual tracks into a set of promising options for site specific scoping. The candidate options will then be analysed and a final residuals management option selected.

There is a significant tension between the urgent need to dispose properly of residuals, reinforced by judicial decree and schedule, and the fact that the process for such a decision would ordinarily take far longer than the time allowed. The record shows that the Boston Harbor WWTP siting decision, from ENF filing to Final EIR approval, took over two years, and those involved in preparation and review of those reports know that the state and federal governments made major efforts to accomplish the analysis as quickly as possible. The siting decision involved three identifiable sites, essentially one treatment technology, and one transportation option. This sludge decision involves a multitude of potential sites, five major treatment processes, three transportation options, and a number of lesser variations in processing. Nonetheless, by judicial decree, a Draft EIR is required to be filed within 13 months of ENF filing, with a Final EIR 4 months later.



While the length of time required for proper environmental review to occur is frustrating to many, it is clear to me that the framing of the right questions, the accumulation and evaluation of data, the drawing of tentative conclusions, and the testing of data and conclusions by a thorough public and agency review is the only process through which a viable decision can be made for a problem of this complexity. Such a process takes an irreducible amount of time. An extraordinarily disciplined study effort will be required if the process is to lead to a conclusion that is not fatally flawed by defects in data, analysis, or thought.

I believe the Authority can and must plan out its study effort to meet the Court deadline of a February, 1987, Draft EIR. This requires that the study plan be well conceived and executed from the beginning. The proper questions must be framed. Interim conclusions must be subjected to scrutiny while the study is ongoing, so that study elements which build on those conclusions do not need repetition, if the conclusions prove defective. Proponent resources - time and expertise-- must not be diverted into unproductive efforts. The study must be structured so that parallel efforts may proceed, where they are mutually independent.

While a conventionally structured Draft EIR could study the issues before the proponent, to prepare one would ordinarily take between two and four years, given the difficulty of the issues presented. That is not possible here. I have therefore crafted a tightly structured study design which I believe will meet the joint needs of the Court Decree and thoughtful environmental review.

4.0

SCHEDULE

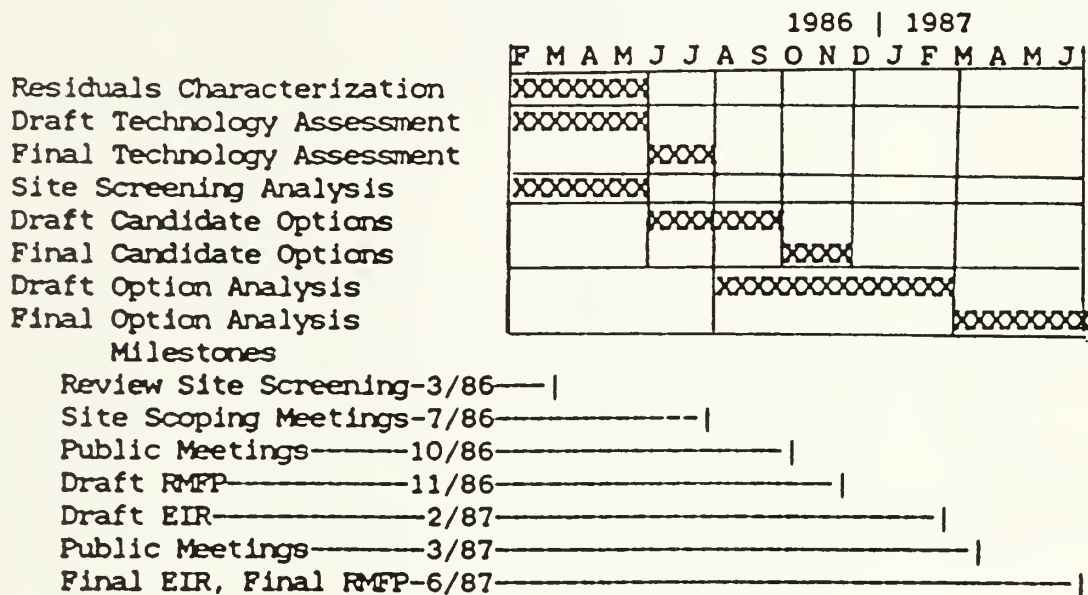
The study design calls for the preparation and review of five study components. To comply with court deadlines, the reports must be submitted on the following schedule:

- | | |
|-------------------------------------|-----------------|
| 1. Residuals Characterization Study | June, 1986 |
| 2. Draft Technology Assessment | June, 1986 |
| 2A. Final Technology Assessment | August, 1986 |
| 3. Site Screening Analysis | June, 1986 |
| 4. Draft Candidate Options Report | September, 1986 |
| 4A. Final Candidate Options Report | November, 1986 |
| 5. Draft Option Analysis Report | February, 1987 |
| 5A. Final Option Analysis Report | June, 1987 |

Each report shall be submitted to me for review, noticed in the Environmental Monitor, and made available for a 30-day agency and public review and comment period. A seven day period for my comment shall follow the close of the public comment period.

The proposed schedule for the submission of these documents is illustrated below, along with court mandated deadlines and other milestones of the process. In accordance with this schedule, major rounds of public meetings will be scheduled for July, 1986 (with site scoping meetings), October, 1986, and March, 1987.

PROPOSED SCHEDULE - MWRA RMFP SPECIAL PROCEDURE



I suggest that MWRA develop a detailed schedule of the project for submission to my office as soon as is possible. In this fashion, EOEa can monitor the progress of the effort and plan for both staff and public review of documents in a timely and efficient manner.

5.0

STUDY DESIGN

The following sections describe the anticipated contents of the five studies required in the special procedure. These are intended to provide general guidance to the project.

5.1 Residuals Characterization Study

The residuals characterization study will consist of a sampling and analysis program to document the quality of influent to and residuals from existing facilities, a summary of the pretreatment program, and a projection of the quantity and quality of each residual stream in the future.

5.1.1 Residuals Sampling and Analysis

The MWRA proposed an extensive residuals sampling and analysis program in Volume III of the Phase I report. The proposed program is generally acceptable, but may require some modifications to respond to concerns expressed by the DEQE, the U.S. EPA, and members of the public with both air toxics and unusual compounds, such as phthlates. The MWRA should review the proposed program with these concerns in mind before choosing a final parameter list.

5.1.2 Pretreatment Program Summary

The MDC began and the MWRA is pursuing an aggressive pretreatment program to limit metals and toxics discharges to the MWRA system. Since this should have a profound effect on the quality of residuals in the near future, this program shall be fully discussed, its current effectiveness documented, and its future effectiveness estimated. Attention should also be given to the combined sewer overflow program, sewer separation program, infiltration and inflow reduction, and any other ongoing or planned program to reduce residuals volumes or improve residuals quality.

5.1.3 Projection of Future Residuals

Detailed projection of the quantity and quality of each residual stream should be prepared for appropriate horizon years during the planning period. This should be based on the Phase I efforts, the results of sampling and analyses, the anticipated results of quality improvement programs, and existing literature sources. Horizon years should include the year of initiation of the long term program (1991), the year of full primary treatment (1995), the initial year of secondary treatment (ca. 2000), and the design year for the program (ca. 2012). The characterization should present separate projections for each residual stream from each source, including primary and secondary treatment, combined sewer overflow treatment, and headworks. Sludge projections should be made separately for the North and South System flows, since important quality differences are apparent. In providing quality characterizations, the report must discuss

the expected concentration of each contaminant and the range about that expectation. In this fashion, succeeding efforts can present both an anticipated case and a worst case.

This report, which can build heavily on Volume I of the Phase I report, will establish the quantity and quality baseline for the assessment of residuals processing technologies.

5.2 Technology Assessment

The technology assessment, which is to proceed independently of the site screening, may also build heavily on the work of Phase I. In addition, information should be provided on the impact potential of each technology component, on available mitigation measures to control impacts, on the screening of technologies, and on the detailed criteria for suitable sites for the technologies.

5.2.1 Phase I Screening Results

The Phase I report provides a detailed summary of available and potential residuals processing technologies and screens these to 14 process trains showing promise. In the Phase II effort, it may be desirable to disaggregate these trains into their component technology "blocks" for clarity of discussion. In addition, it is recommended that further consideration be given to in vessel wet air oxidation, co-incineration with municipal solid waste or fossil fuels, and co-composting with municipal solid wastes. Further, it is suggested that materials transfer and transportation be treated as technology "blocks", rather than as a separate topic, to simplify the analysis.

5.2.2 Assessment of Impact Potential

In order to determine the probable effects of each technology block, a detailed description of the construction and operating parameters of each should be prepared. These should key on potential emissions to air, water, and the ground for the range of residuals that might be treated by each technology. When the multimedia and multiparameter emissions are understood, they should be compared to existing standards, criteria, and guidelines, including the developing guidelines for air toxics. A general public health risk assessment for the anticipated emissions should also be carried out. This will establish the baseline, unmitigated effects of each technology.

5.2.3 Mitigation Assessment

Based on the results of the assessment of impact potential, each technology should be examined to determine available and feasible mitigation measures to reduce emissions to all media. This will lead to the description of a specific mitigation program for each technology block. Revised multimedia, multiparameter emission estimates should then be prepared for each technology block and the general public health risk benefits of the mitigation programs should be documented. A failure risk discussion should be prepared for each technology block, stressing the redundancy necessary to prevent failure. Finally, a general program for monitoring, process control, and risk management should be proposed.

5.2.4 Technology Screening

While the technology screening of Phase I was successful in identifying potentially viable process trains, it was difficult to follow. Much of this difficulty can be traced to an early mixture of site considerations into the technology criteria. For the Phase II technology assessment, a relatively pure list of criteria should be developed for a refined screening. This screening should be carried out on technology blocks, rather than complete trains, since process trains may only emerge from the combination of technologies and sites. Following a ranking or rating of technology blocks, the viable technologies should be summarized. Non-viable technologies may be dropped from analysis after the conclusions are tested in the Draft Technology Assessment Report.

5.2.5 Site Suitability Criteria

Following the full analysis of the technology blocks, a set of site suitability criteria should be developed for each block. Conceptually, these criteria should be thought of as descriptors of the best possible site for a given technology. They may then serve as the base for rating of site/technology combinations. These criteria should be sensitive to the mitigated impacts of each technology block. For instance, location over an aquifer, considered a preemptive constraint in the Phase I report, may indeed be preemptive for land filling or direct land application. It may, however, only be a moderate effect on composting and a negligible effect on incineration or thermal processing. It is these technology specific differences that must be clearly reflected in the choice of site suitability criteria.

The Technology Assessment Report will be of great importance in the development of successful and environmentally acceptable residuals management options. For this reason, the special procedure envisions the preparation of both a Draft and Final Technology Assessment, with public review of the Draft and response to comments in the Final.

5.3 Site Screening Analysis

The site screening analysis in the Phase I reports drew considerably more comment, and more adverse comment, than did the technology assessments. For this reason, I am requiring that the Phase I screening criteria be refined, that the screening of the 200 sites considered in Phase I be reprised and summarized, that new sites be considered, and that a comparison be carried out to identify candidate sites for further consideration. This will occur early in Phase II process so that an informed analysis of potential site/technology combinations can be made. It is intended that this analysis proceed essentially independently of the technology assessment, with the results of the two efforts jointly forming the basis for the development of residuals management options. Coastal, inland, and island sites should all be treated and screened equally for all potential technology blocks.

5.3.1 Site Screening Criteria

As discussed above, the site screening criteria of Phase I were not clear and may have been overly restrictive. Thus, an early effort in the Phase II site screening analysis will be to develop a list of screening criteria for major groups of technology blocks. These groups should include transportation/transfer operations, intermediate processing operations, and final processing/disposal operations. This can be approached as an initial description of the ideal site for a given technology, which will be refined in the form of site suitability criteria at the end of the technology assessment. They should also not be overly restrictive or preemptive. As an example, transportation access may not preempt a site that is otherwise extremely suitable; cost savings in using such a good site may well set off the cost of providing special access.

5.3.2 Reexamination of Phase I Sites

The 200 or so sites considered in Phase I should be compared, in tabular form, to the newly developed criteria. This reexamination should be based on existing data with, at

most, site walkover confirmation. Those appearing to offer promise should be extracted from the tabular listing and briefly described in the text.

5.3.3 New Sites

Many speakers at the public meetings indicated that superior sites, generally not in their communities, had been overlooked in the Phase I efforts. In order to assure the broadest possible consideration of sites, the MWRA should consider a site nomination process, perhaps through newspaper advertisement. In addition, telephone or personal interviews should be carried out with the community planners in each of the MWRA communities to solicit nominations. Finally, both the Division of Capital Planning and Operations and the Government Services Administration files should be consulted to identify any currently unused Commonwealth or Federal lands that might be suitable for siting of residuals management facilities.

5.3.4 Identification of Candidate Sites

The new sites should be examined, in tabular form, by the criteria developed for the reexamination of the Phase I sites. Again, those sites offering promise should be extracted from the listing and briefly described. The two lists of potential candidate sites should then be combined and jointly subjected to a more rigorous ranking under the screening criteria. At this stage of the analyses, it may be necessary to perform limited site specific investigations to resolve uncertainties about site characteristics, but major field programs should be delayed until the selection of viable site/technology combinations for residuals management.

This effort should result in a listing of between 10 and 20 candidate sites which appear to be suitable as locations for one or more of the major technology blocks needed to develop a residuals management plan. This short list will be reduced further in the candidate options studies.

5.4 Candidate Options Study

Following the completion of the Technology Assessment Report and the Site Screening Analysis Report, the MWRA shall develop combinations of technology blocks and sites to yield complete residuals management options. This will involve, first, a ranking of sites against the detailed suitability criteria for each technology block and, second, the assemblage of viable combinations of technology blocks and sites into residuals

management options providing for transport, transfer, intermediate processing, and final processing or disposal of residuals. It is expected that this process will lead to the selection of from three to six such options for detailed site investigations and analysis.

In the development of residuals management options, it appears appropriate that the MWRA consider one class of alternatives outside the MWRA service district. While there is both equity and reason to restrict the location of new sites to the district, serious consideration should be given to existing capacity outside the district. In particular, some disposal options, such as incineration, co-incineration with municipal solid waste, and landfilling, may be available on a contract basis from existing operations. These might offer an economical means of residuals disposal without the expense and impact potential of new site development.

5.4.1 Candidate Site Assessment

This process may be envisioned as the development of a three dimensional matrix with technologies, criteria, and sites as its axes. It may be reduced to a two dimensional problem by considering a single site as it meets or does not meet the site suitability criteria for each of the technology blocks of interest. These rankings may then be compared among sites to identify those sites which particularly well satisfy the criteria for one or more technologies and those sites which satisfy less well the criteria for a broad range of technologies. Both types of site will be of interest in the development of candidate residuals management options. Sites of the first type may be favored because they are ideally suited for one process. Sites of the second type might be favored if they allow many process to be located on the same site, thus simplifying transportation and handling of residuals.

5.4.2 Candidate Option Development

Based on the results of the candidate site assessment, the MWRA should assemble a suite of complete residuals management options. These should key on both the most favorably ranked technologies and on the most favorably ranked sites. Such options might be built up by beginning with a major technology block, such as incineration, located on the most favorable site for incineration and then adding to the option each of the transport, transfer, and pre-processing steps required, located either on their own most favorable site or co-located on the primary site. In developing these options, attention should be paid to

partial options, such as composting for the cleanest of the sludge and other viable process splits, such as that between North System and South System sludges or that between sludge and other types of residuals. As is apparent, an "option" here might involve one or more major technologies on one or more sites and might be amenable to sequential development to meet processing needs for existing residuals in 1991, for full primary sludge in 1995, and for secondary sludge about 2000. At any event, it should be the aim of this task to develop from approximately three to six such options. These might involve several especially favorable sites, each of which can then be subject to much greater field investigation and monitoring. Because the availability of these key sites may prove crucial to the success of an option and because access to these sites will be required for detailed field investigations, it is desirable that the MWRA obtain purchase options on these sites prior to the publication of this Report.

5.4.3 Residuals Management Option Scoping

At the midpoint in the preparation of the Draft Candidate Options Report, a series of scoping meetings will be held. The purpose of these meeting, which may be combined with information meetings on the project, will be to develop detailed scopes for site investigations and analyses at the most suitable sites identified for residuals management facilities.

The Candidate Options Report will be the touchstone of the Draft Residuals Management Facilities Plan. The combination of site and technology rankings should allow the identification of a preferred option at this stage, with the remaining alternatives carried forward for detailed analysis in recognition of the possibility that detailed site investigations may lead to the raising of one of the alternatives above the apparently preferred option during the succeeding tasks. The Final Candidate Options Report will form the primary basis for the Draft Residuals Management Facilities Plan.

5.5 Option Analysis Report

The analysis of candidate options will include a detailed, site specific investigations of three to six residuals management options carried forward from the candidate option development. It is expected that an extensive field monitoring program will be carried out at each of the sites. Based on the results of these monitoring efforts, detailed multimedia, multiparameter impact modeling will be carried out for each viable technology/site combination. In addition, a specific and detailed public health

risk assessment will be done. Finally, detailed mitigation, performance monitoring, and enforcement programs will be developed for each option. The options will then be ranked, perhaps against a new set of criteria, to illustrate the comparisons among the options and provide a base for decision making. The preference for the most favored option identified above will be confirmed or revised at this time. The results of these investigations, analyses, and decision processes will be published for review and comment. This Draft Option Analysis Report will provide site specific data for the Draft Residuals Management Facilities Plan and will represent the Draft EIR.

Following the public review of the analysis of candidate options, the MWRA will review and respond to all comments received, review and, if necessary revise, the decision criteria and option rankings, and make a final selection of the preferred alternative. The Final Option Analysis Report will mark the end of the Residuals Management Facilities Plan development, will be subject to full public review and, with any necessary modifications, will become the Final EIR for the project.

6.0

CITIZENS ADVISORY COMMITTEE

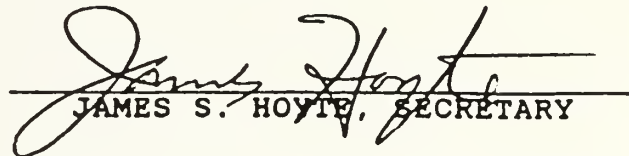
To provide for continued public involvement in the project, the Special Procedure requires the formation of a Citizens Advisory Committee. The CAC may have as its' core the Citizens Advisory Group already established by the MWRA. Additional nominations for the CAC will be accepted from agencies and the public, following publication of a notice in the Environmental Monitor. The final makeup of the CAC will be reviewed by EOEa to assure that it is small enough to work efficiently, yet sufficiently diverse to represent a cross section of the potentially impacted public. In addition, expanded subcommittees of the CAC may be formed when the individual site investigations begin to provide local review by members of the affected communities.

The MWRA may also wish to establish a Technical Advisory Committee of agency reviewers and independent experts. This group, which should be a small, select committee, can provide agency expertise and scientific peer review to the MWRA during the project. This would go far to assure that the highest technical standards are adhered to and counter any potential suspicion of bias in the results of this effort.

This Special Procedure has been reviewed informally by the DEQE, the U.S. EPA, and the proponent. Detailed schedules and scopes of work for each of the tasks outlined above will be

developed by the MWRA. These will be reviewed by my office, the DEQE, and the U.S.EPA, revised as appropriate, and incorporated into this Special Procedure by adoption. These and any other additions or modifications to the Special Procedure will be noticed in the Environmental Monitor.

February 20, 1986
DATE


JAMES S. HOYTE, SECRETARY

JSH/SGM/SD/bk

